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{NASA-TM-88615} AGRICULTURAL SPECTRAL  
SIGNATURES: YUMA TEST SITE, MISSION 91-8,  
4-7 FEBRUARY 1974 {NASA} 137 p

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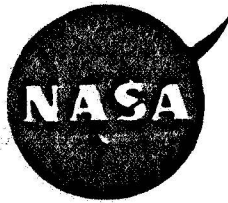
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AGRICULTURAL SPECTRAL SIGNATURES

YUMA TEST SITE

MISSION 91 - 8

FEBRUARY 4 - 7, 1974

Dr. R. H. GRIFFIN, II

REPORT NO. 102

15 MARCH 1974

LYNDON B. JOHNSON SPACE CENTER

## INTRODUCTION

Basic to agricultural remote sensing applications is the study of crop signatures in the field at various growth stages and under various growing conditions.

A crop signature study is being conducted by the Earth Resources Laboratory at the University of Arizona Agricultural Experiment Station, Yuma, Arizona.

The purpose of the study is to determine areas of the spectrum and crop growth stages that would allow for the greatest probability of identification of each specific crop.

A layout of the Experiment Station is presented in Figure 1. The present study is being conducted in fields C-4 through C-14, identified in the figure as the "Signature Study" and the "Alkaloid Field Study".

The detailed plot plan for the spectral signature study is given in Figure 2. The numbers in the lower portion of each plot will be used throughout the study to reference the individual plots. Plots 7-11, 18-22, 24-33, and 40-44 will be planted in mid-February, 1974.

Figure 3 presents details of the alkaloid yield study area. Data points are indicated by the numbers 51-55 which will be used throughout the study to reference the individual plots. Due to the layout of the study, data cannot be obtained from treatment number 2.

Spectral data was taken with an Exotech model E20D filterwheel spectrometer mounted on a truck-boom 20 feet above the ground (Fig. 4 & 5). Three detectors were available; 1) Silicon (Si) with a wavelength range of 490-1290 nanometers was used at every field data point; 2) Lead Sulfide

(PbS) with a wavelength range of 900-3100 nanometers will be used at selected field data points; 3) Mercury-Cadmium-Telluride (HgCdTe) with a wavelength range of 4100-14400 nanometers will be used during the latter part of the study on selected field data points after calibration of the detector is completed.

A Hasselblad model 500 E1 with 80mm lens was mounted on the truck boom (Fig. 5) parallel to the spectrometer in order to photograph the spectrometer target. The spectrometer footprint was drawn on each photograph and vegetation ground cover percentage determined.

Incoming radiation was measured with an Eppley Pyranometer and recorded for each day that spectrometer data was taken (Fig. 6). Air temperature and relative humidity were recorded at two and five feet above the ground. Table 1 contains data taken at 1 hour intervals from 7 am to 6 pm on the days when spectrometer measurements were made.

Ground level photographs were taken of each sampling point along with observations on height, growth stage, and general crop conditions.

Spectral signatures from the Si and PbS detectors were obtained by ratioing the target reflectance against the incoming radiation to give percentage reflectance. The HgCdTe detector data will be presented as apparent temperature.

This is one of a series of data reports; each will contain the data collected at the Yuma, Arizona test site since issuance of the previous report. A final analysis and summary will be issued after the study is completed.

Data was collected February 4-7, 1974 from the following targets: cabbage, broccoli, onions, poppy - 1, poppy - 3, bare ground, cauliflower, carrot, chick peas, poppy - 2, poppy - 4, and poppy - 6.



# FIELD NUMBERING SYSTEM

UNIVERSITY OF ARIZONA - YUMA VALLEY EXPERIMENT STATION

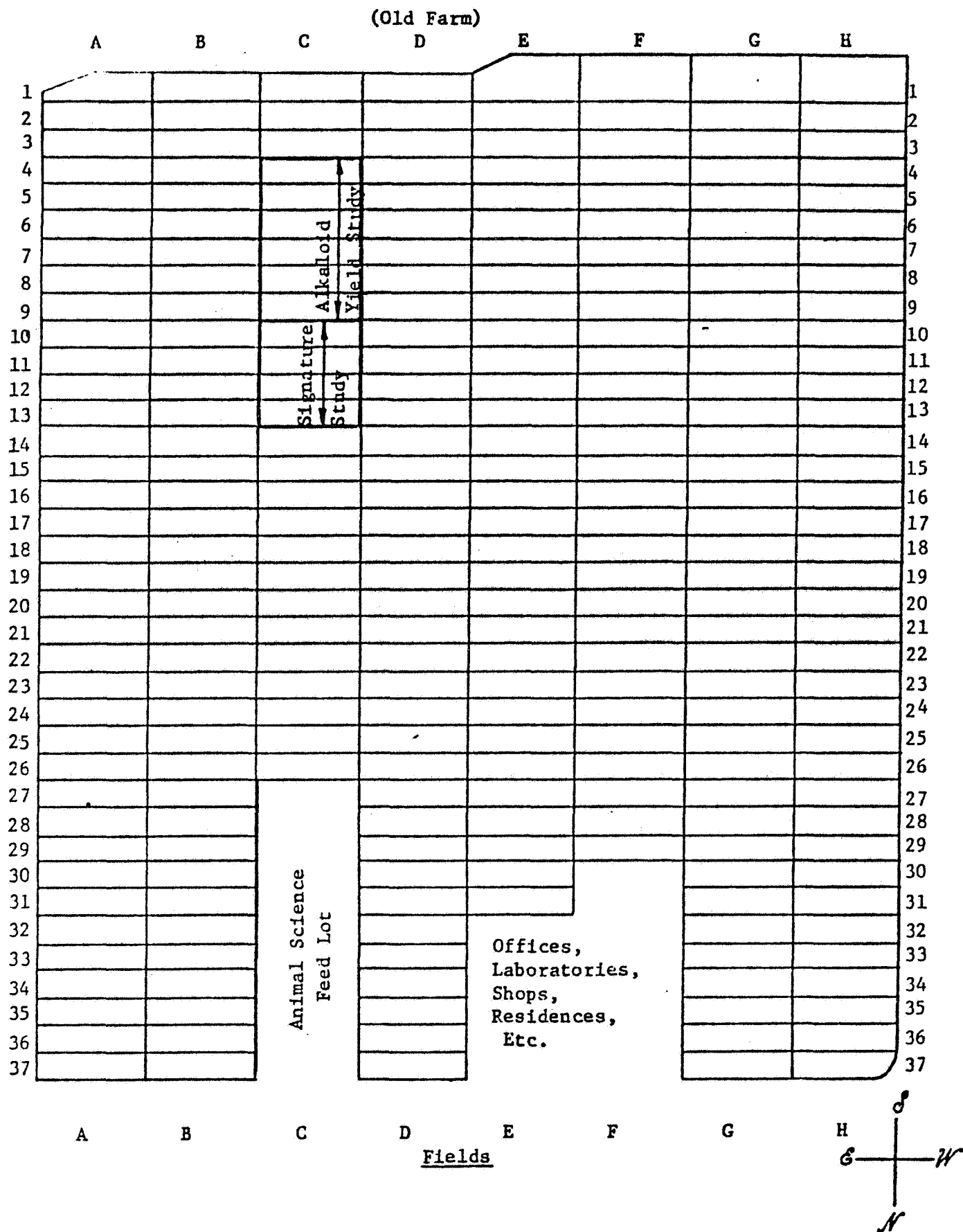


Figure 1 STATION PLAN

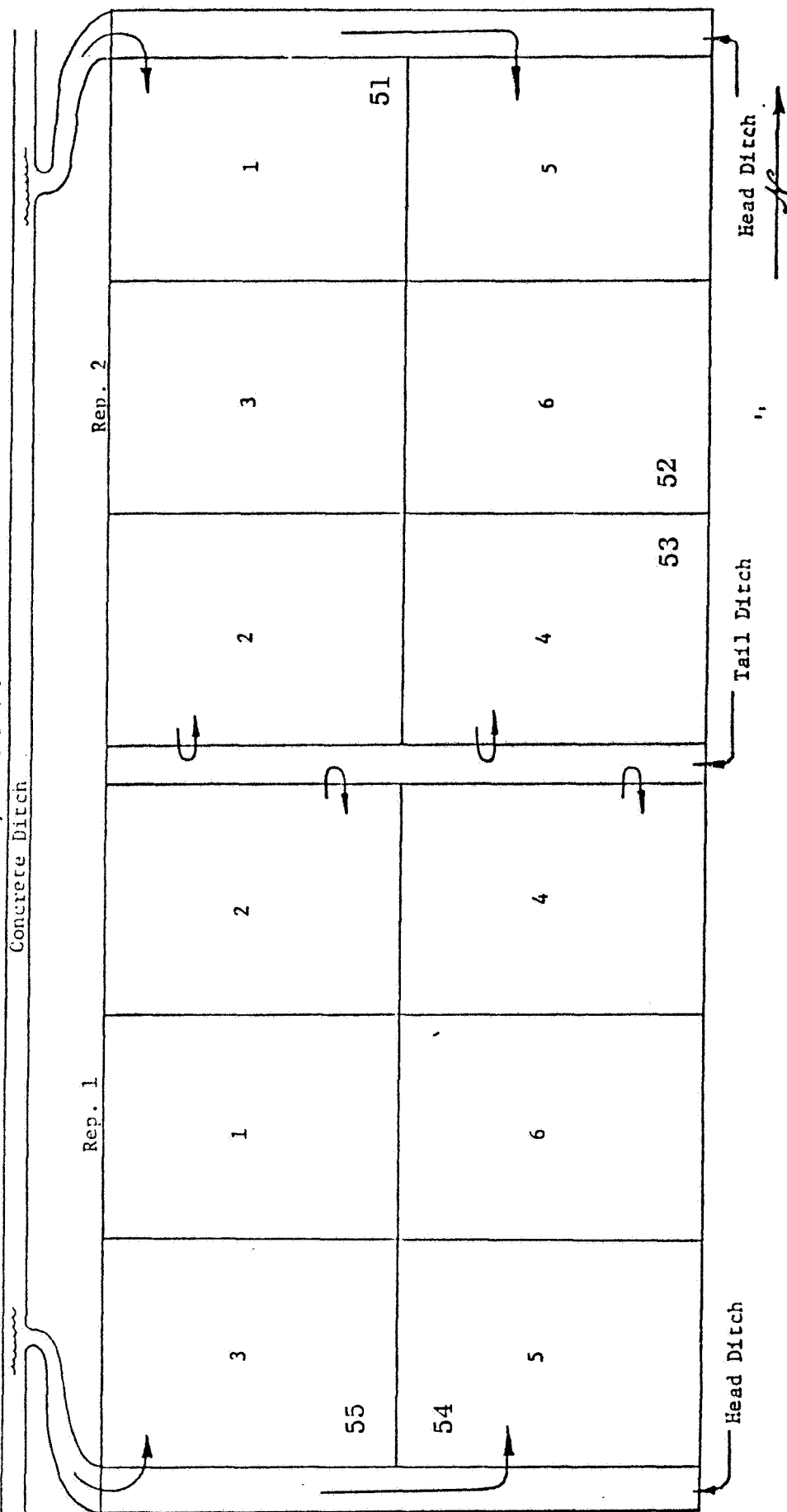
### Concrete Ditch

\* Moisture to be determined by Tensiometer

Dry

Figure 2      SIGNATURE STUDY PLAN

POPPY  
Alkaloid Yield Study  
USDA, U of A Cooperating  
Field C, Border 4-9  
Concrete Ditch



DATA POINT	TREATMENT IDENTIFICATION
51	1. Variety 1 6 cm spacing
55	2. Variety 1 12 cm spacing
53	3. Variety 1 18 cm spacing
54	4. Variety 2 6 cm spacing
52	5. Variety 2 12 cm spacing
	6. Variety 2 18 cm spacing

Note: Rows will run North and South to minimize light effect of the sun.  
Plot Size: 140' x 60'  
Pre Plant Fertilizer: 100 lbs P<sub>2</sub>O<sub>5</sub> 50 lbs N  
Planting Date: November 7, 1973.  
Germination Irrigation: November 8, 1973

Figure 3 ALKALOID YIELD STUDY PLAN

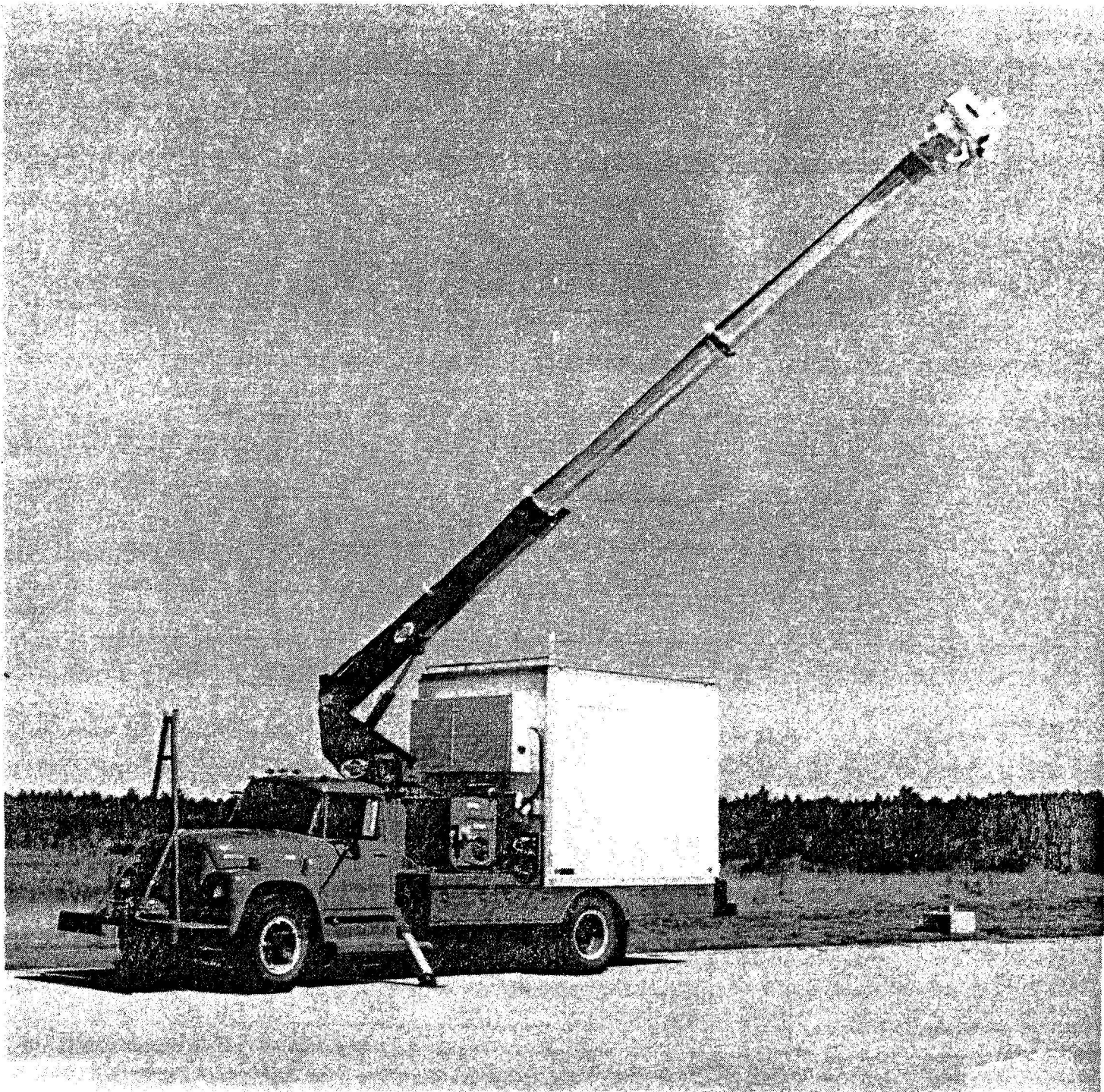
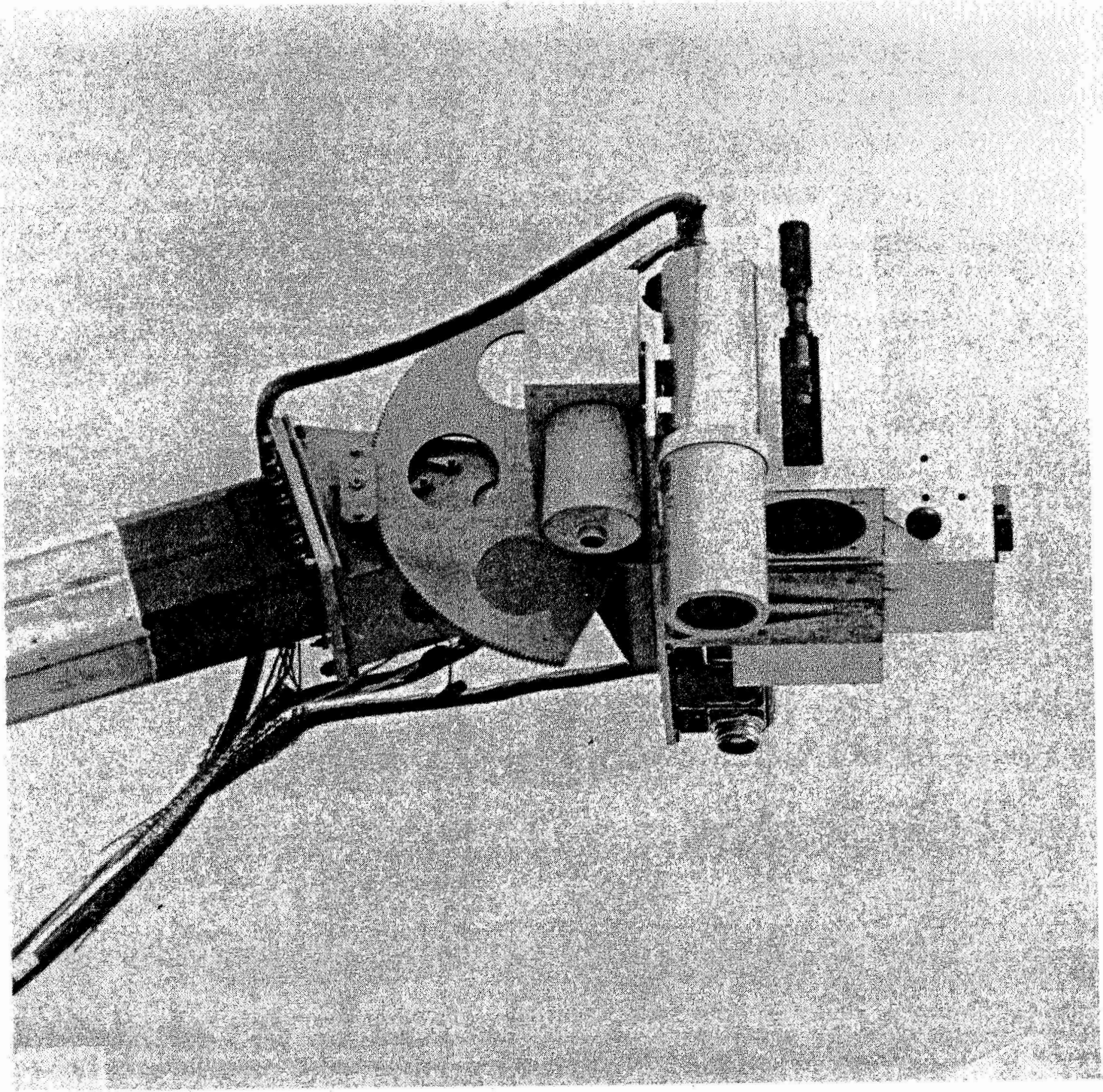
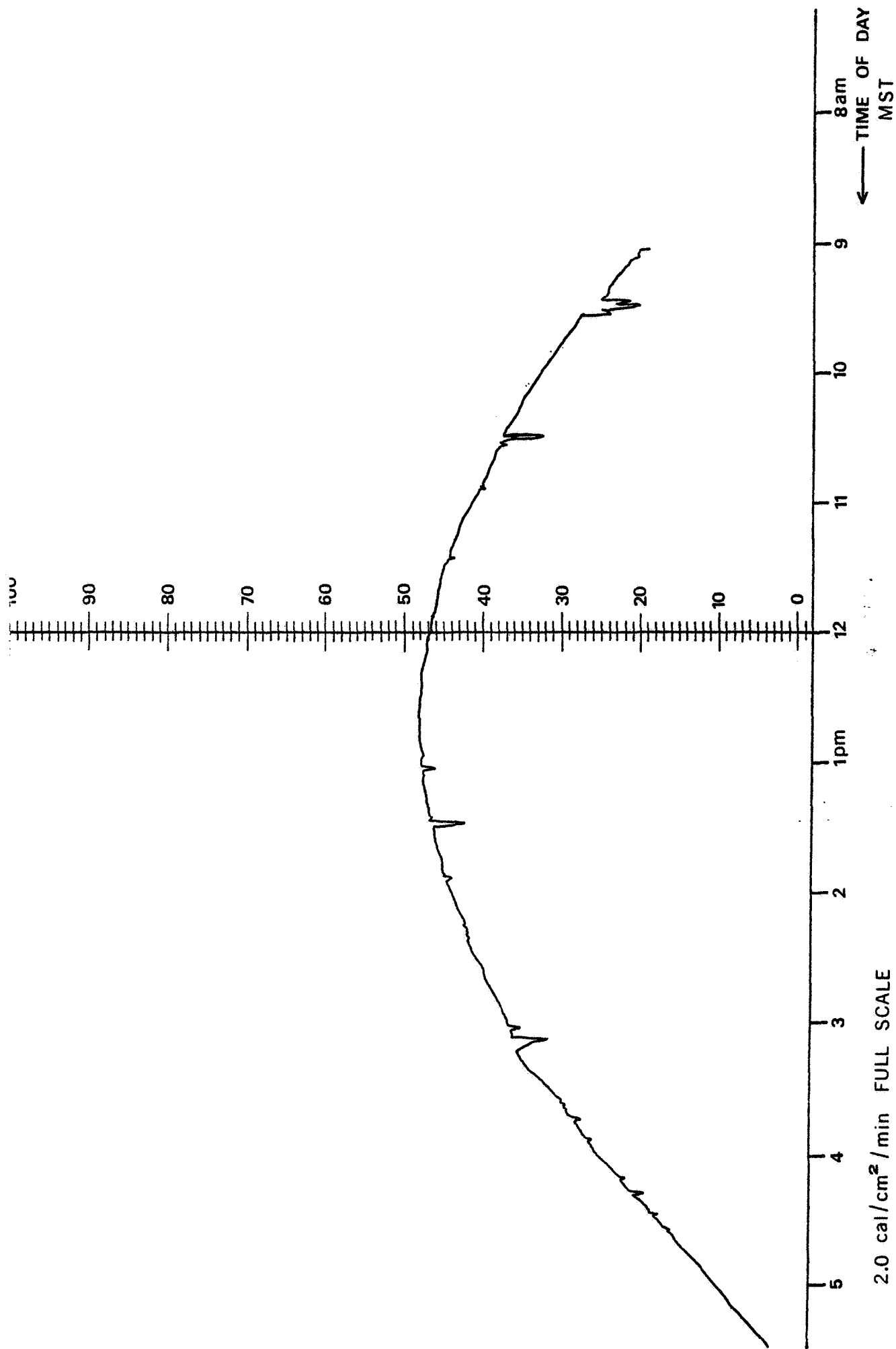


Figure 4 ERL REMOTE SENSING INSTRUMENTED VAN



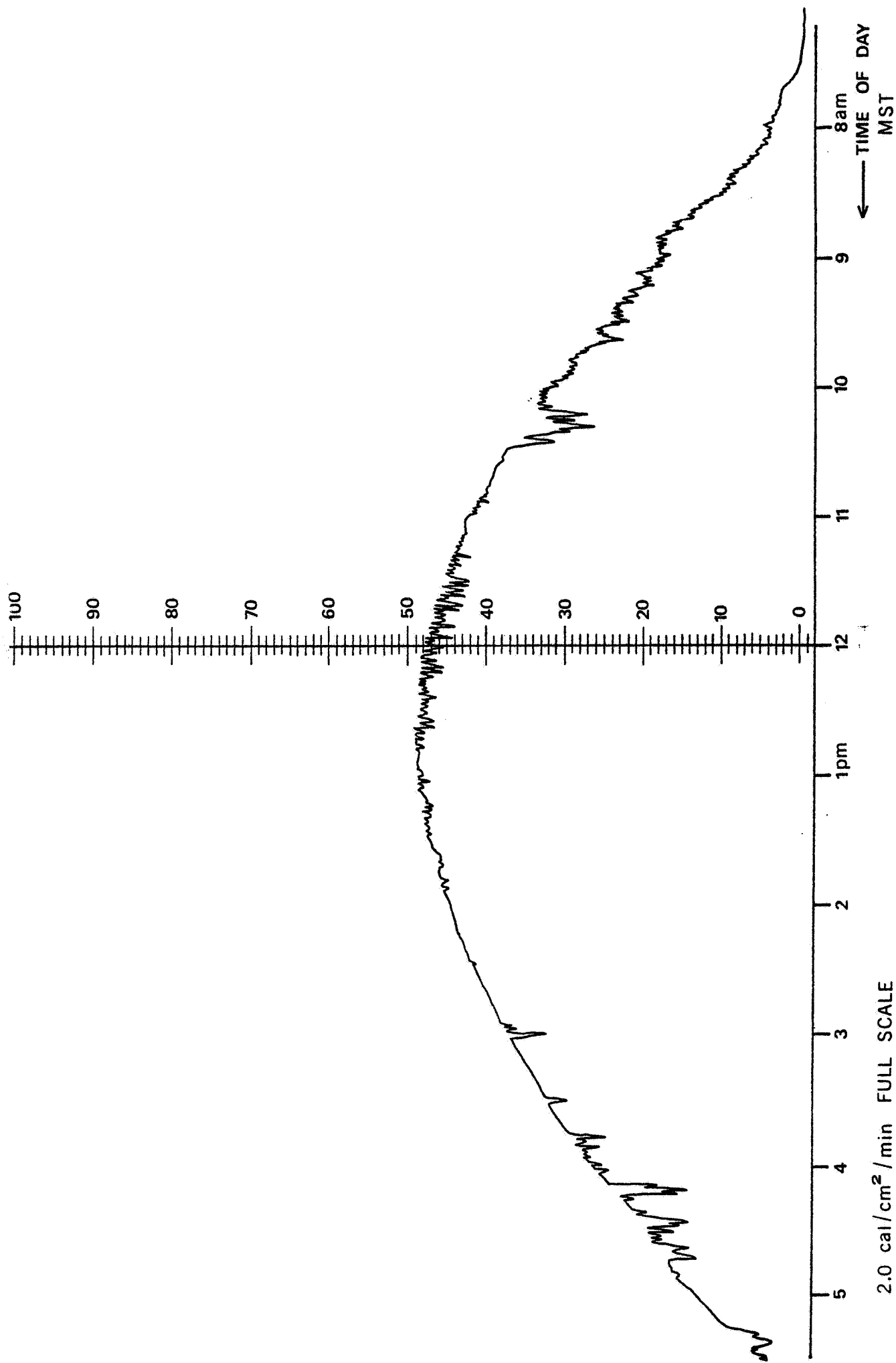


**Figure 5      TRUCK BOOM MOUNTED SENSOR SYSTEM**



FEBRUARY 4, 1974

Figure 6 PYRANOMETER CURVE



FEBRUARY 5, 1974

Figure 6 PYRANOMETER CURVE

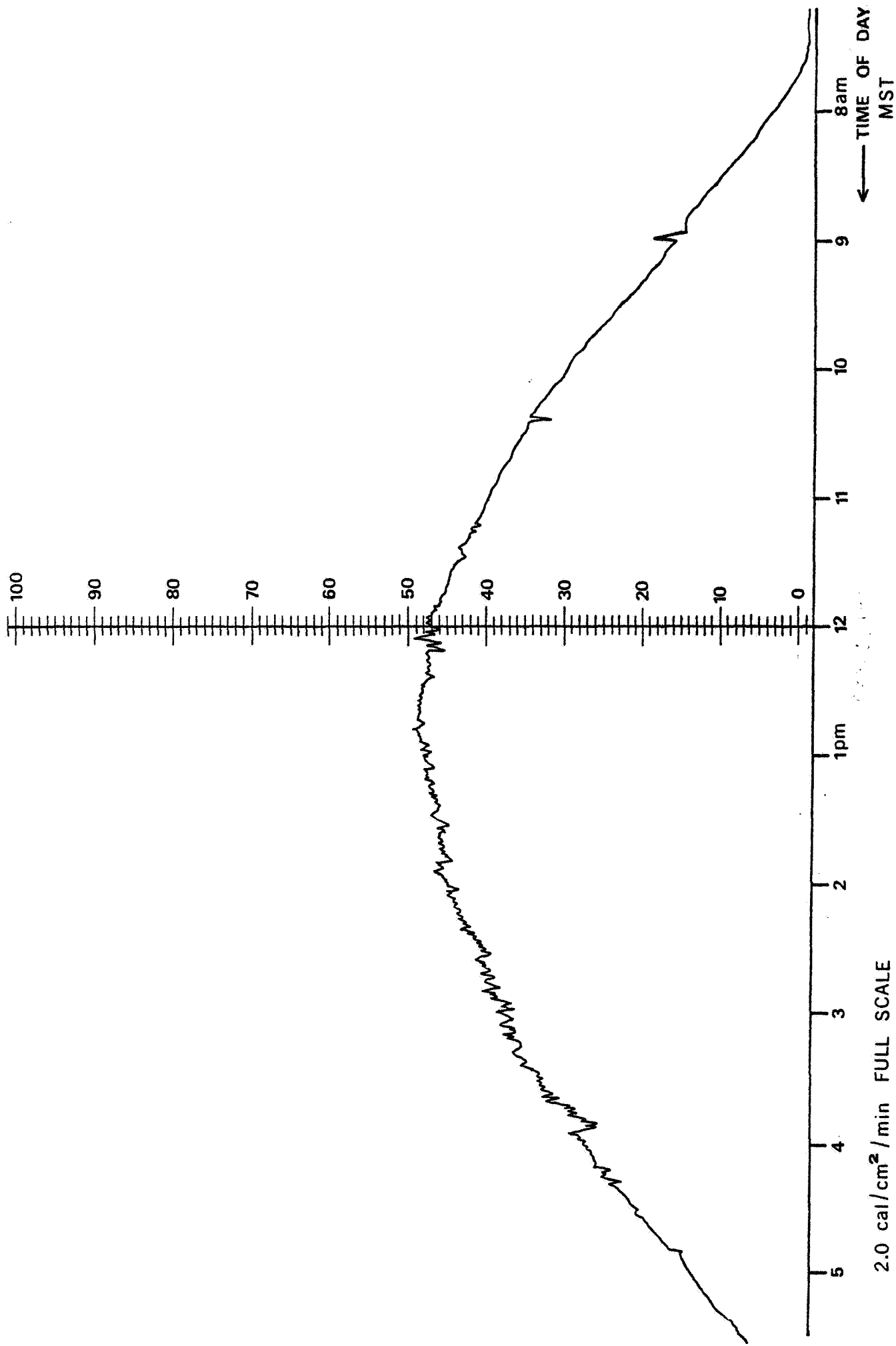


Figure 6 PYRANOMETER CURVE



Table 1      RELATIVE HUMIDITY and TEMPERATURE

FEBRUARY 4, 1974

TIME	2 FEET		5 FEET	
MST	R.H. %	TEMP. °F	R.H. %	TEMP. °F
7 am		NO DATA		
8 am				
9 am				
10 am	34	64	30	62
11 am	31	67	27	65
12 am	28	71	24	68
1 pm	25	73	22	71
2 pm	24	75	22	72
3 pm	22	75	21	72
4 pm	24	74	22	72
5 pm	26	73	24	72
6 pm	34	63	26	68

Table 1      RELATIVE HUMIDITY and TEMPERATURE

FEBRUARY 5, 1974

TIME	2 FEET		5 FEET	
	R.H. %	TEMP. °F	R.H. %	TEMP. °F
7 am	86	34	96	36
8 am	86	36	76	37
9 am	60	48	50	46
10 am	44	60	30	54
11 am	32	64	30	62
12 am	32	65	29	62
1 pm	30	67	28	65
2 pm	28	68	26	66
3 pm	28	68	25	66
4 pm	28	67	25	65
5 pm	27	65	25	65
6 pm	28	58	25	60

Table 1      RELATIVE HUMIDITY and TEMPERATURE

FEBRUARY 6, 1974

TIME	2 FEET		5 FEET	
	R.H. %	TEMP. °F	R.H. %	TEMP. °F
7 am	44	46	38	46
8 am	52	45	42	46
9 am	40	52	34	50
10 am	36	53	32	53
11 am	34	58	31	56
12 am	32	59	30	56
1 pm	31	60	29	58
2 pm	29	61	27	58
3 pm	28	61	26	59
4 pm	28	61	26	59
5 pm	28	59	26	59
6 pm	28	57	26	57

## PLOT DETAILS

THIS SECTION CONTAINS FOR EACH PLOT THE FOLLOWING DETAILS:

- CROP HISTORY
- GROUND LEVEL PHOTO
- BORESIGHT PHOTO
- GROUND TRUTH DATA
- SPECTROMETER CURVE

PLOT NO. 1

CABBAGE

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing
Nov 9, 1973	Irrigated
Nov 12, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 12"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28 1974	Hoed weeds
Jan 29 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 1

CABBAGE

## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
ec 12, 1973	2	5	Moist	Normal	-
ec 18, 1973	2.5	2	Dry	Thinning-shock Slightly wilted	Thinned Dec 17, 1973
an 3, 1974	4	5	Moist 1.5" down	Cold-wilted	-
an 10, 1974	5	17	Moist .5" down	Normal	-
an 14, 1974	5	20	Wet	Normal	-
an 25, 1974	6	25	Moist 1" down	Normal	5% weeds, salt on rows - Jan 21, 1974
an 30, 1974	7	25	Moist 2" down	Normal	-
Feb 7, 1974	9	25	Wet	Normal	Irrigated Feb 4, 1974 no weeds

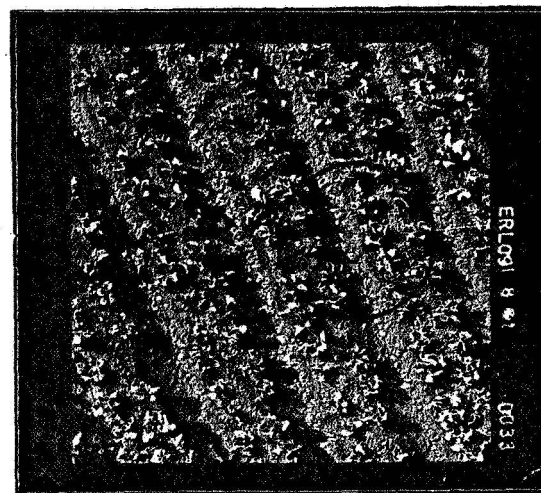
PLOT NO. 1

CABBAGE

FEBRUARY 4, 1974



GROUND LEVEL



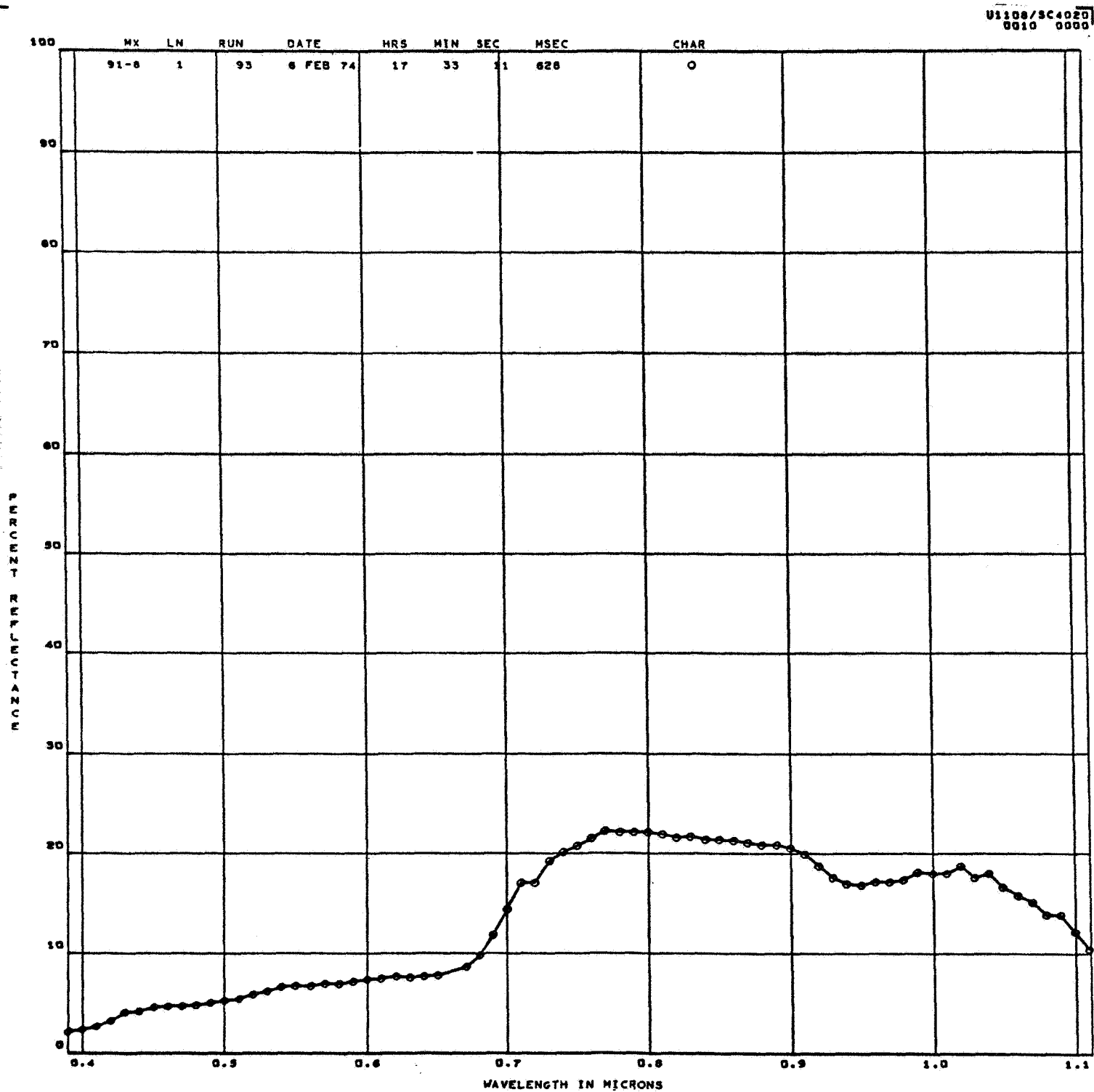
BORESIGHT

Circle represents spectrometer footprint

PLOT NO. 1

CABBAGE

SPECTROMETER SIGNATURE





PLOT NO. 2

BROCCOLI

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing
Nov 9, 1973	Irrigated
Nov 12, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 14"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 2

BROCCOLI

## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 12, 1973	2	5	Moist	Normal	-
Dec 18, 1973	2.5	2	Moist 1" down	Thinning-shock Slightly wilted	Thinned Dec 17, 1973
Jan 3, 1974	4	5	Moist 1.5" down	Cold-wilted	-
Jan 10, 1974	5	15	Moist .5" down	Normal	-
Jan 14, 1974	6	18	Wet	Normal	-
Jan 25, 1974	8	22	Moist 1" down	Normal	Tens. = 20, salt on rows Jan 21, 1974
Jan 30, 1974	9	24	Moist 2" down	Normal	-
Feb 7, 1974	10	30	Wet	Normal	Irrigated Feb 4, No weeds tens. = 30

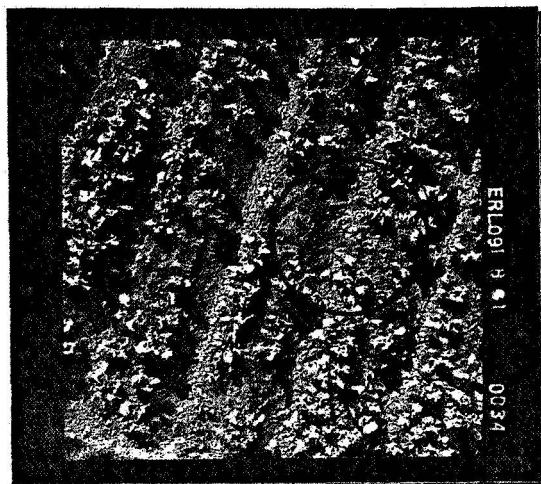
PLOT NO. 2

BROCCOLI

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

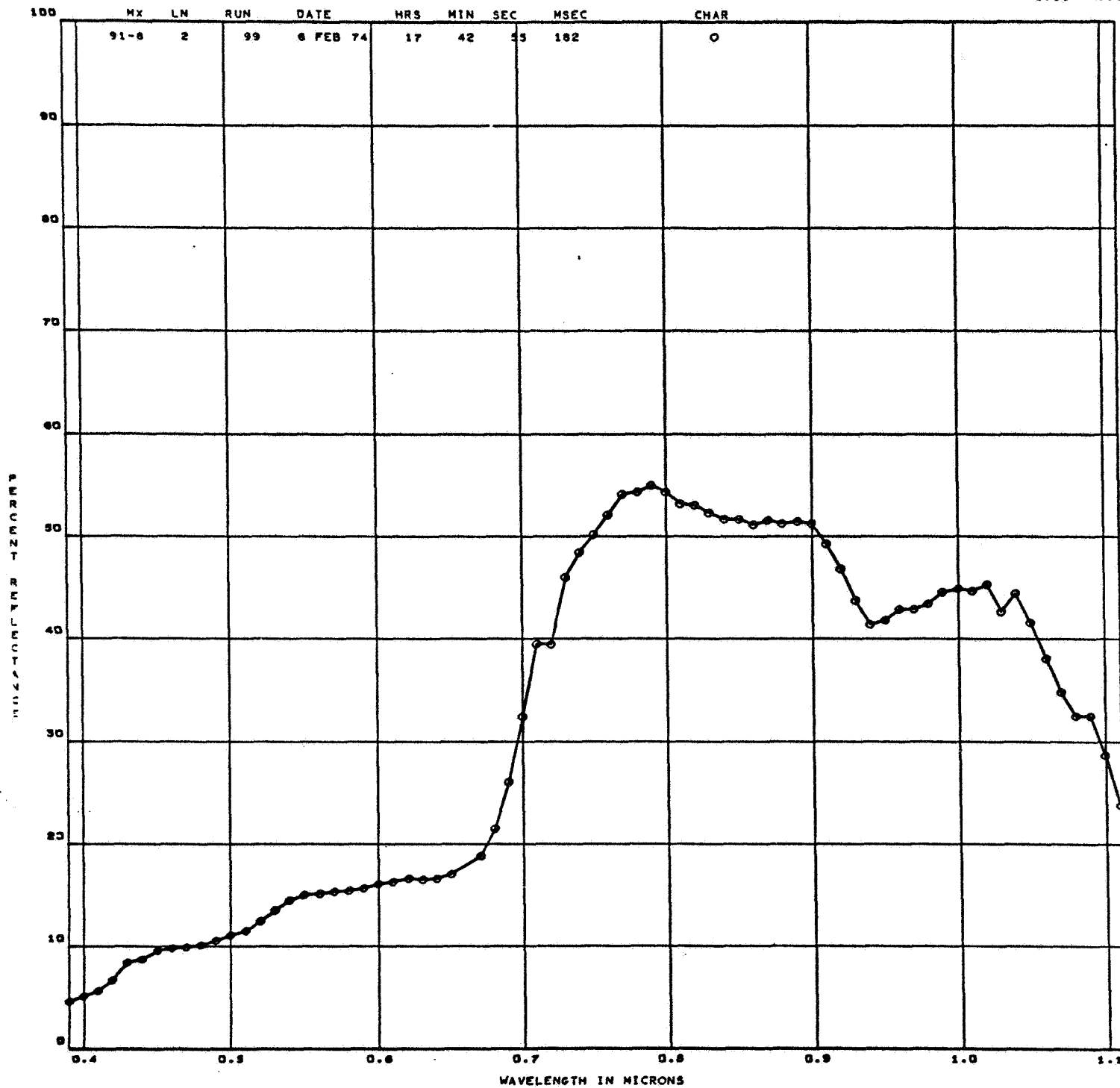
Circle represents spectrometer footprint

PLOT NO. 2

BROCCOLI

SPECTROMETER SIGNATURE

U1106/SC4020  
0011 0000



PLOT NO. 3

ONIONS

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 4 rows on 40" beds with 4-8-4" spacing
Nov 9, 1973	Irrigated
Nov 21, 1973	Irrigated
Nov 26, 1973	First emergence
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Hand weeded - Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 3

ONIONS

## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 12, 1973	-	1	Moist	Normal	-
Dec 18, 1973	.5	1	Moist 1" down	Wilted	-
Jan 3, 1974	3.5	2	Moist 1.5" down	Cold-wilt	-
Jan 10, 1974	3	10	Moist .5" down	Normal	-
Jan 14, 1974	4	8	Wet	Normal	Weeded, Thinned
Jan 25, 1974	6	15	Moist 1" down	Normal	Jan 14, 1974 Salt on rows Jan 21, 1974
Jan 30, 1974	7	15	Moist 2" down	Normal	-
Feb 7, 1974	8	17	Wet	Normal	Irrigated Feb 4, no weeds

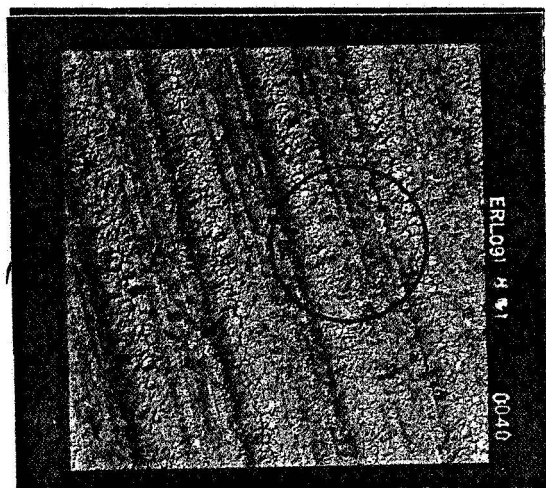
PLOT NO. 3

ONIONS

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

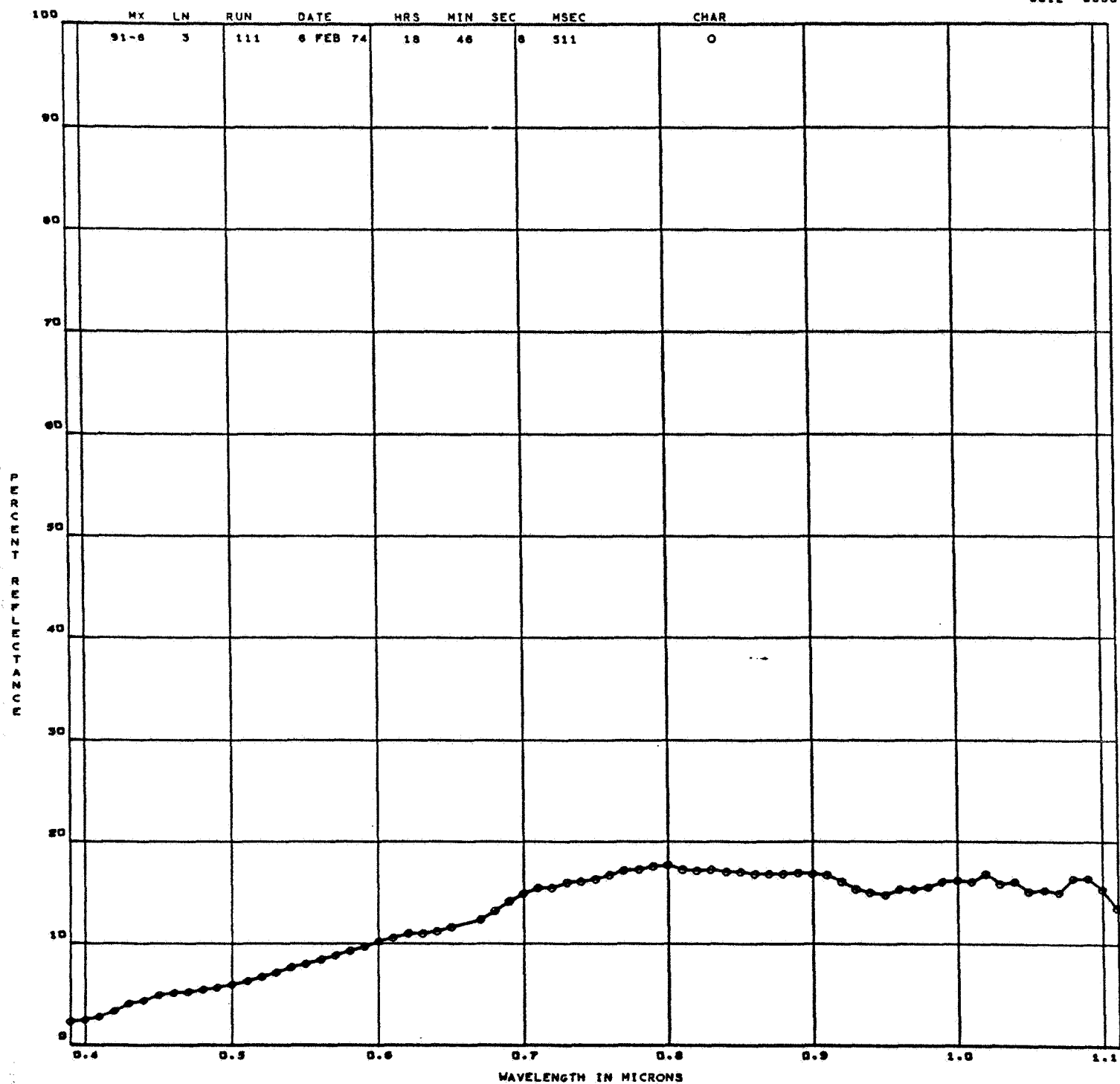
Circle represents spectrometer footprint

PLOT NO. 3

ONIONS

SPECTROMETER SIGNATURE

U1108/3C4020  
0012 0000





PLOT NO. 4

POPPY - 1  
(Acquisition No. B-40-6-3)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 9" between plants in drill
Nov 9, 1973	Irrigated
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 9"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 4

POPPY-1  
(Acquisition No. B-40-6-3)

## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	.5	1	Moist 1" down	Wilted	Thinned Dec 17
Jan 3, 1974	1.5	5	Moist 1.5" down	-	-
Jan 10, 1974	2	12	Moist .5" down	Normal	-
Jan 14, 1974	3	22	Wet	Normal	-
Jan 25, 1974	5	27	Moist 1" down	Normal	Salt on rows
Jan 30, 1974	7	27	Moist 2" down	Normal	Jan 21, 1974
Feb 7, 1974	10	30	Wet	Normal	Irrigated Feb 4, no weeds

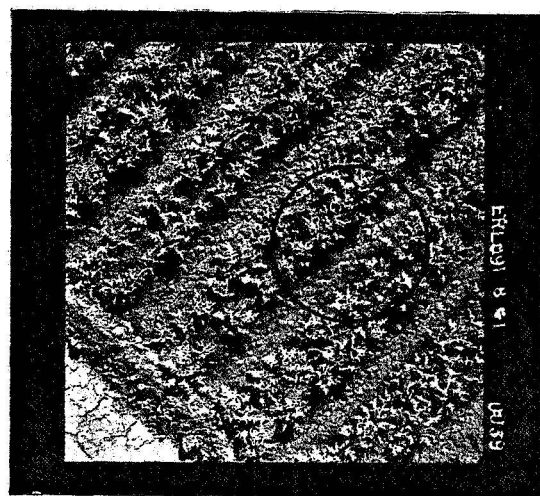
PLOT NO. 4

POPPY - 1

FEBRUARY 4, 1974



GROUND LEVEL



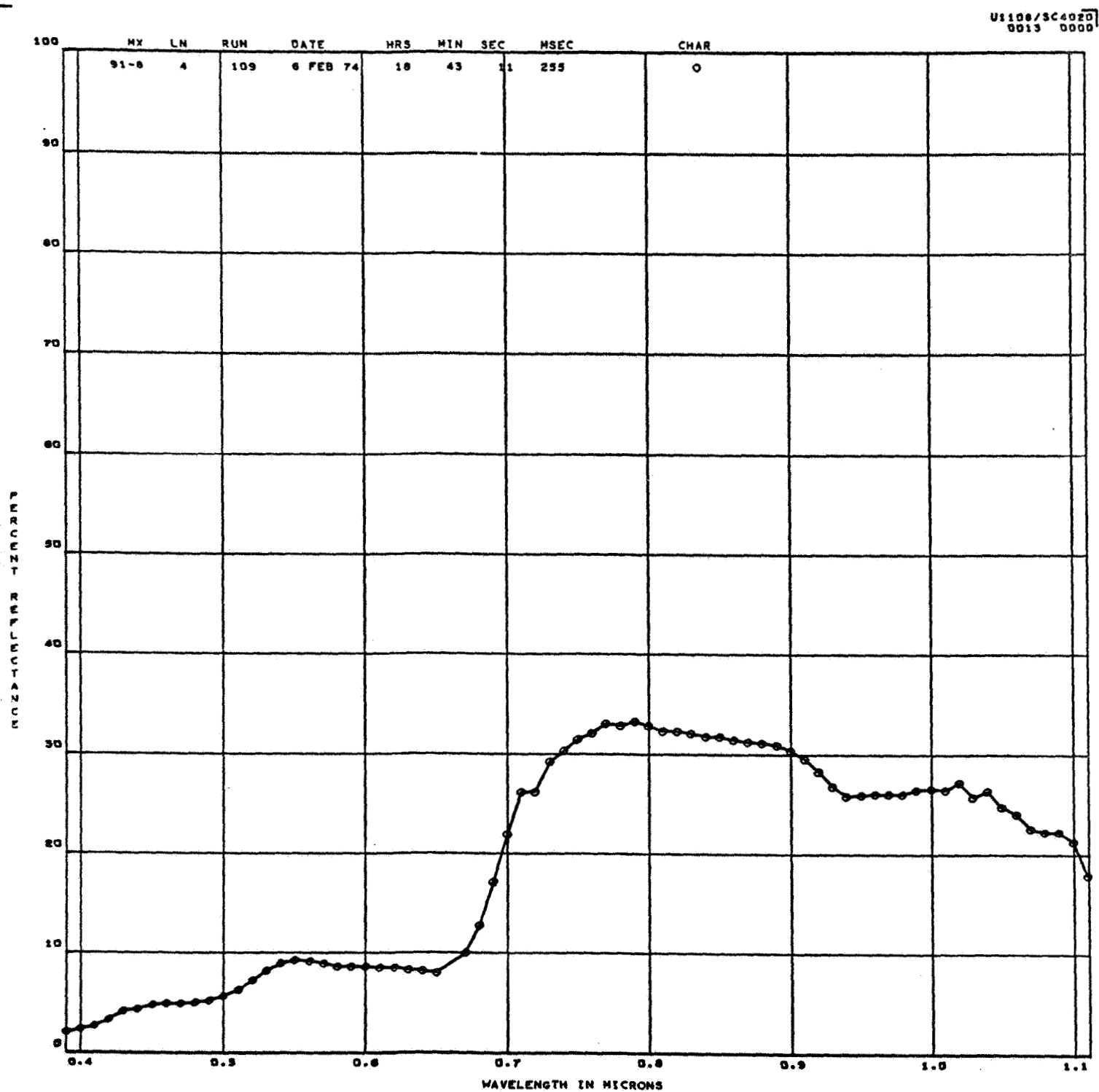
BORESIGHT

Circle represents spectrometer footprint

PLOT NO. 4

POPPY-1

SPECTROMETER SIGNATURE



PLOT NO. 5

POPPY - 3  
(Acquisition No. 371923)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 9" between plants in drill
Nov 9, 1973	Irrigated
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 9"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 5

POPPY-3  
(Acquisition No. 371923)

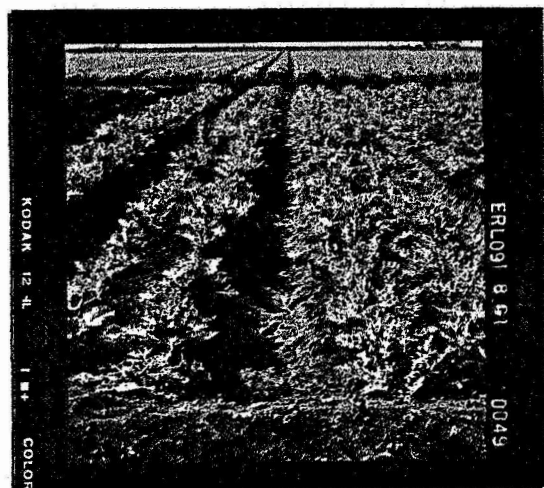
## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	.5	1	Moist 1" down	Wilted	Thinned Dec 17
Jan 3, 1974	-	-	Moist 1.5" down	-	-
Jan 10, 1974	2	12	Moist 1.5" down	Normal	-
Jan 14, 1974	3	22	Wet	Normal	-
Jan 25, 1974	4	25	Moist 1" down	Normal	Salt on rows Jan 21, 1974
Jan 30, 1974	5	25	Moist 2" down	Normal	-
Feb 7, 1974	8	30	Wet	Normal	Irrigated Feb 4, no weeds

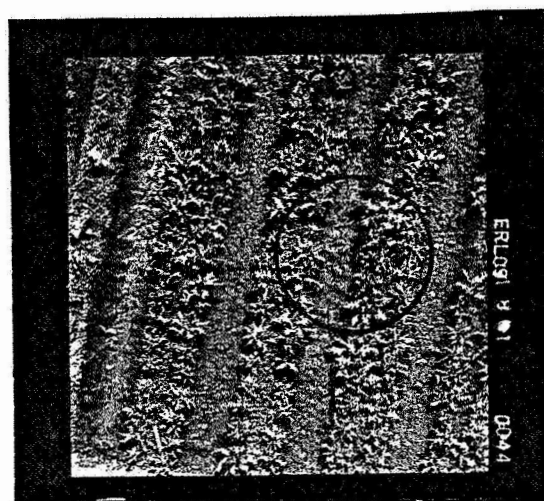
PLOT NO. 5

POPPY - 3

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

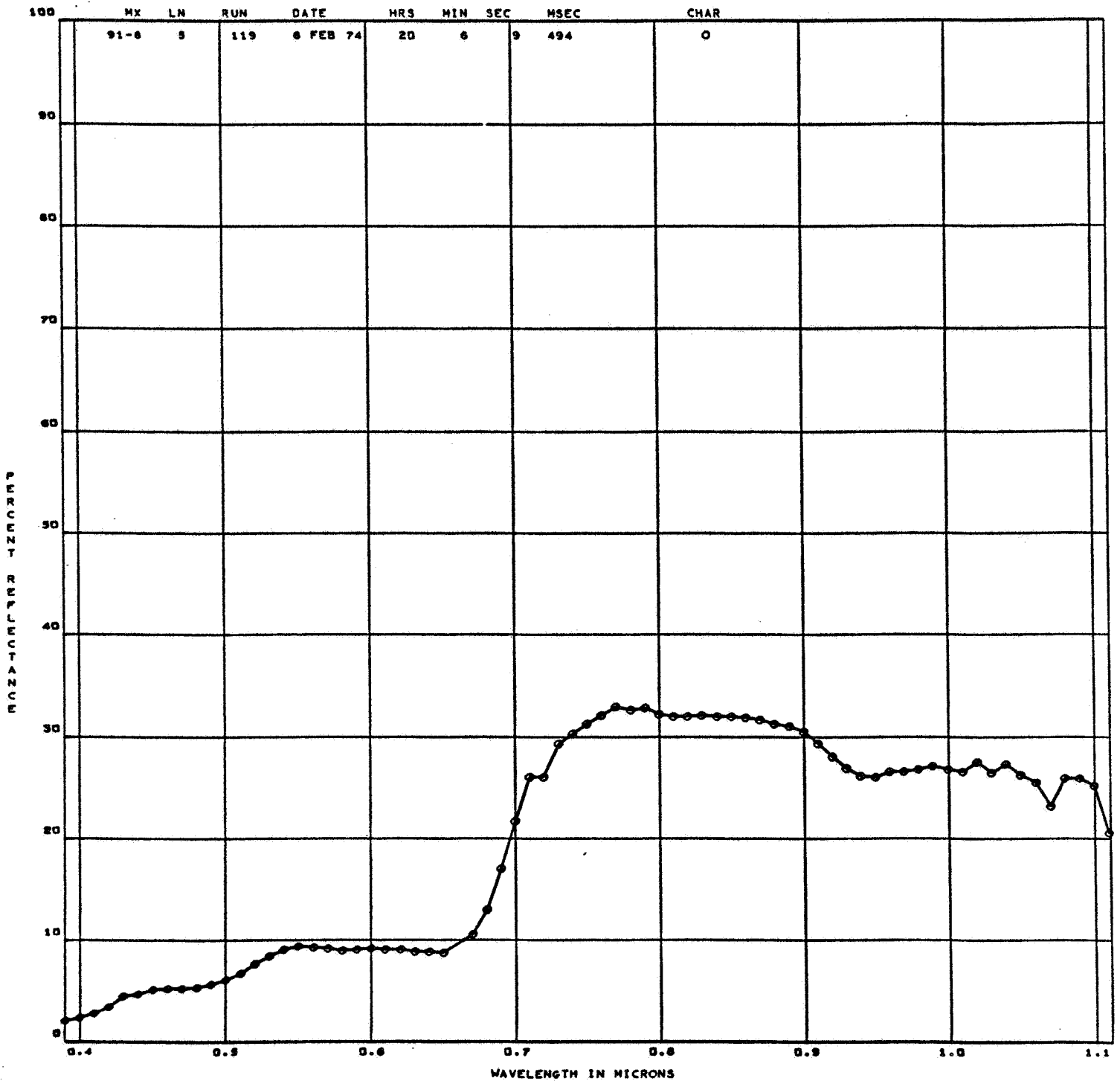
Circle represents spectrometer footprint

PLOT NO. 5

POPPY-3

SPECTROMETER SIGNATURE

U1108/SC4020  
0014 0000





PLOT NO. 6

BARE GROUND  
(WET)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Dec 7, 1973	Fertilized with 50 lbs N/ac - Irrigated
Dec 26, 1973	Cultivated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 6

BARE GROUND  
(WET):

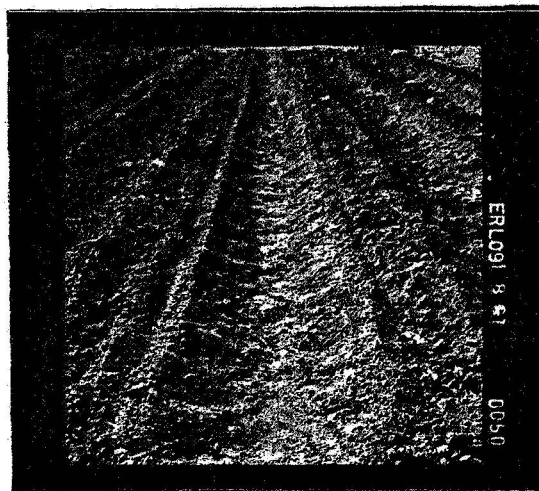
## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 12, 1973	-	-	Moist	-	-
Dec 18, 1973	-	-	Moist 1" down	-	-
Jan 3, 1974	-	-	Dry at 6"	-	-
Jan 10, 1974	-	-	Moist .5" down	-	No weeds
Jan 14, 1974	-	-	Dry	-	No weeds
Jan 25, 1974	-	0	Moist 1" down	-	No weeds
					Salt on rows
					Jan 21, 1974
Jan 30, 1974	-	-	Dry	-	-
Feb 7, 1974	-	-	Dry	-	No weeds

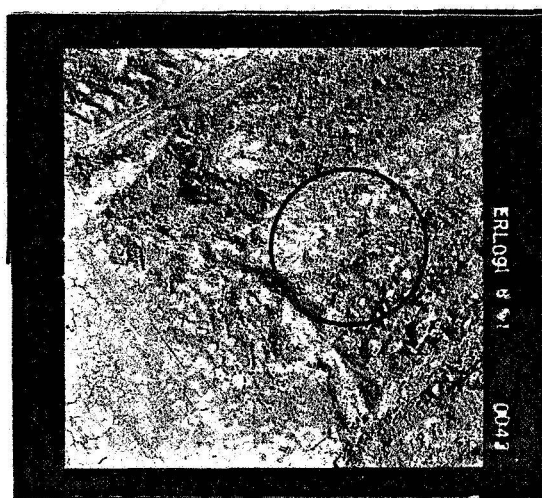
PLOT NO. 6

BARE GROUND  
( Wet )

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

Circle represents spectrometer footprint

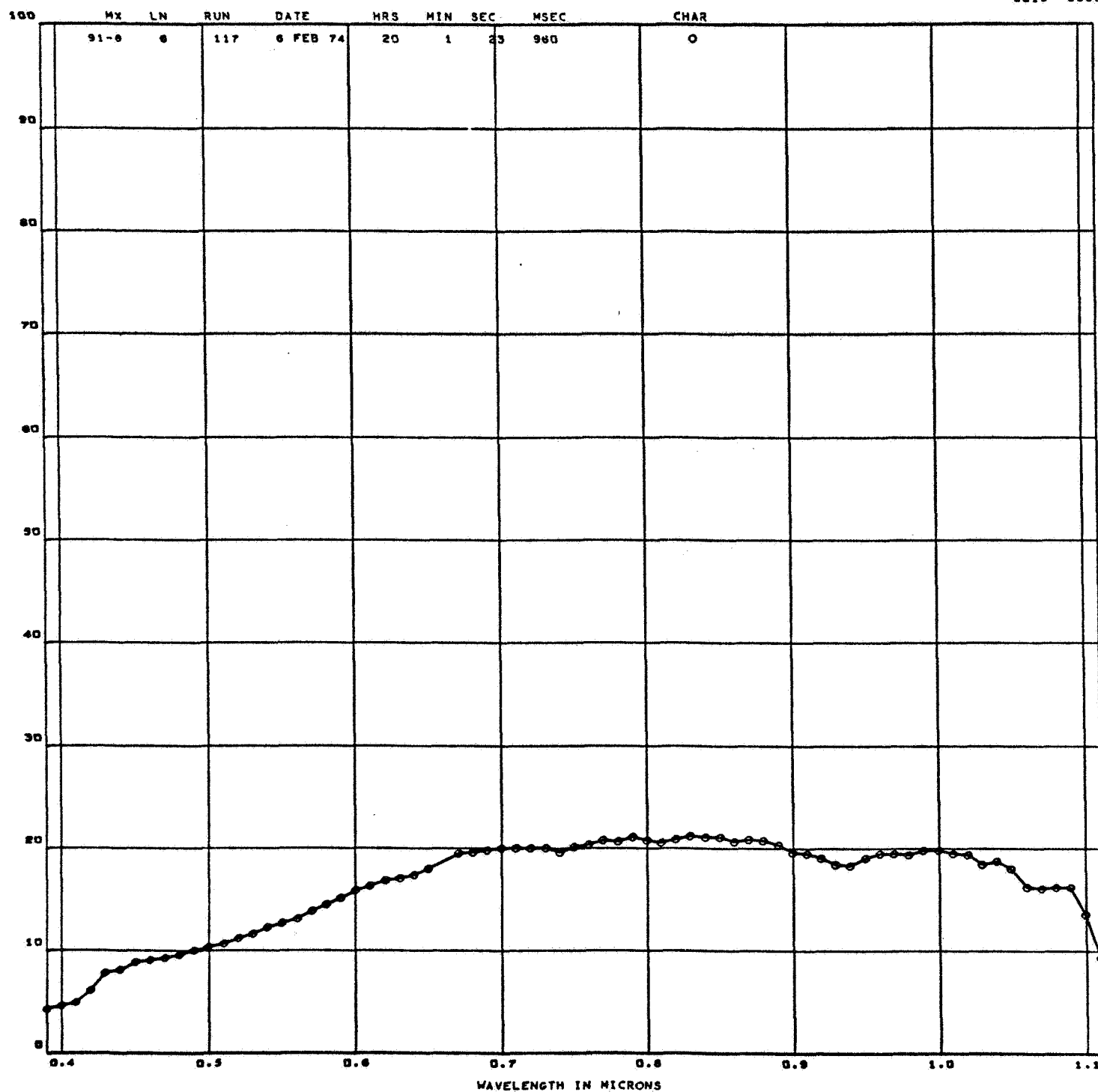
PLOT NO. 6

BARE GROUND

( Wet )

SPECTROMETER SIGNATURE

U1106/SC4020  
0015 0000



PLOT NO. 12

CAULIFLOWER .

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 24" spacing in drill
Nov 9, 1973	Irrigated
Nov 13, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N /Ac - Irrigated
Dec 17, 1973	Thinned to 24"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N /Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 12

CAULIFLOWER

## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 12, 1973	1	6	Moist	Normal	-
Dec 18, 1973	2.5	2	Moist 1" down	Wilted	Thinned Dec 17
Jan 3, 1974	4	-	Moist 1.5" down	Cold-wilted	Few weeds
Jan 10, 1974	6	12	Moist .5" down	Normal	-
Jan 14, 1974	6.5	15	Wet	Normal	-
Jan 25, 1974	9	30	Moist 1" down	Normal	5% weeds, Salt on row Jan 21, 1974
Jan 30, 1974	9	25	Moist 2" down	Normal	-
Feb 7, 1974	12	25	Wet	Normal	Irrigated Feb 4, no weeds

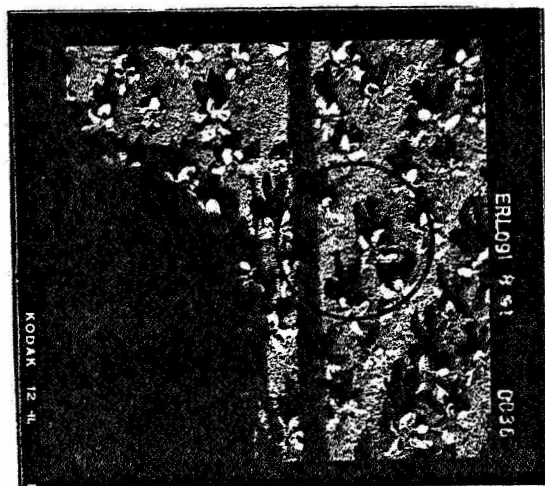
PLOT NO. 12

CAULIFLOWER

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

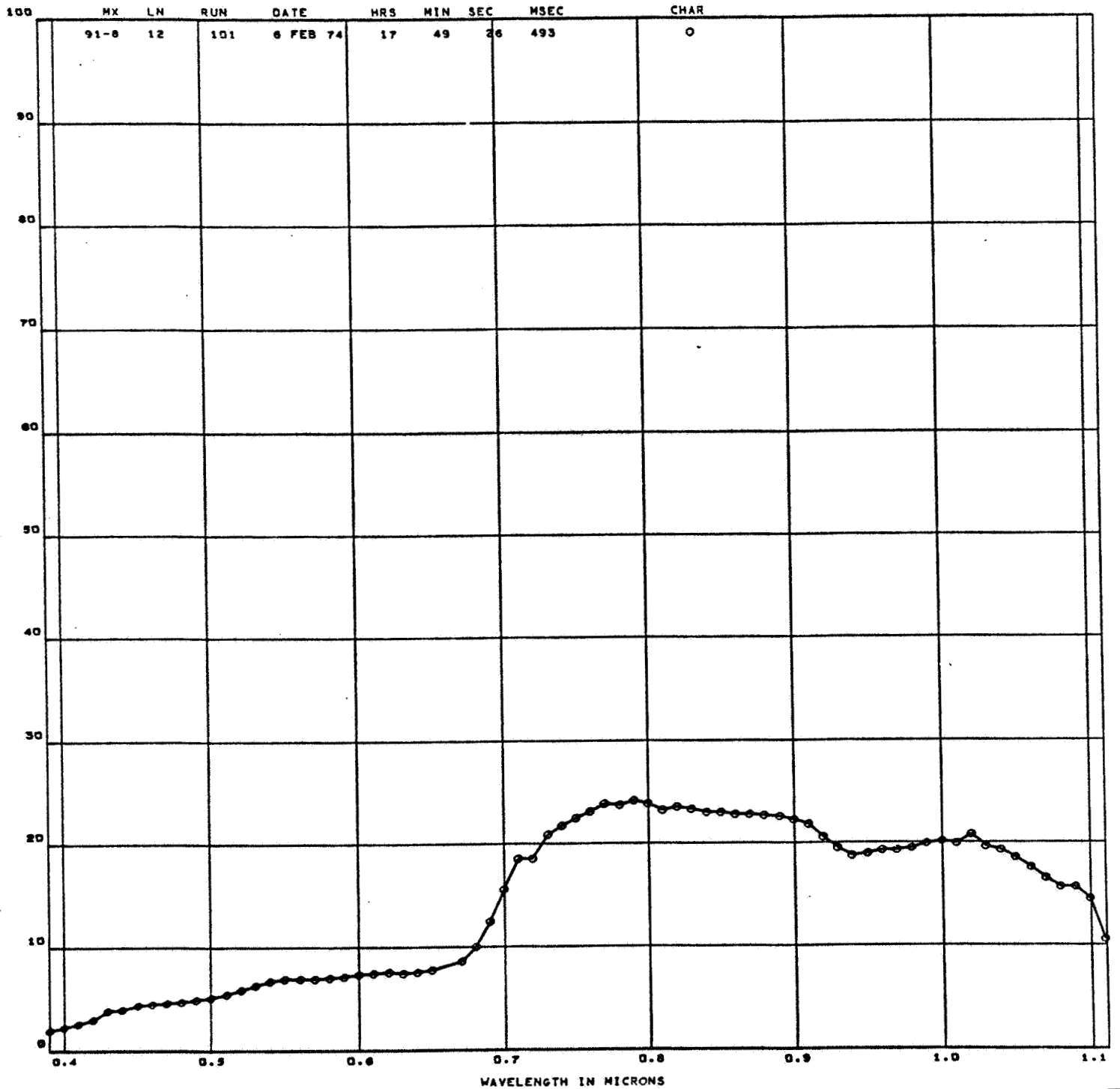
Circle represents spectrometer footprint

PLOT NO. 12

CAULIFLOWER

SPECTROMETER SIGNATURE

U1108/SC4020  
0016 0000





PLOT NO. 13

CARROT

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 4 rows on 40" beds with 4-8-4" spacing
Nov 9, 1973	Irrigated
Nov 21, 1973	Irrigated
Nov 26, 1973	First emergence
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated - Sprayed with Lorax
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 13

CARROT

## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 12, 1973	.25	-	Moist	Normal	-
Dec 18, 1973	.5	1	Moist 1" down	Normal	-
Jan 3, 1974	1	10	Moist 1.5" down	Normal	1% Weeds
Jan 10, 1974	2	30	Moist .5" down	Normal	10% Weeds
Jan 14, 1974	2	20	Wet	Normal	7% Weeds
Jan 25, 1974	4	31	Moist 1" down	Normal	1% Weeds Tens.= 12
					Salt on rows
					Jan 21, 1974
Jan 30, 1974	2	31	Moist 2" down	Normal	-
Feb 7, 1974	5	35	Wet	Normal	Irrigated Feb 4, no weeds, tens.= 34

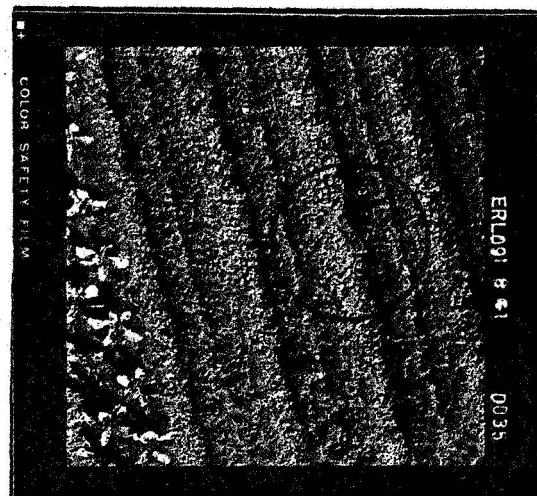
PLOT NO. 13

CARROT

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

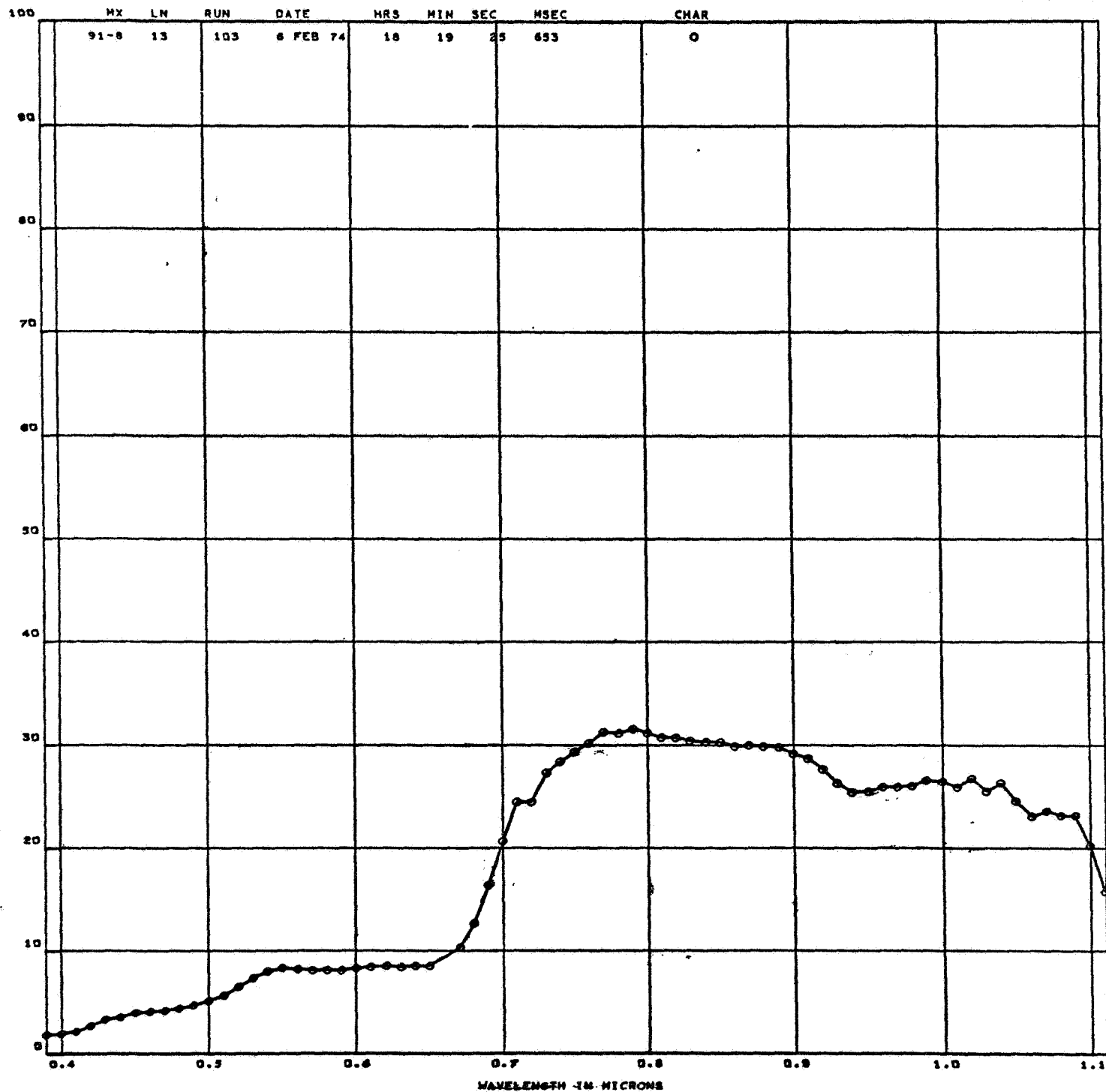
Circle represents spectrometer footprint

PLOT NO. 13

CARROT

SPECTROMETER SIGNATURE

U1100/SC4020  
0017 0000



PLOT NO. 14

CHICK PEAS

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Dec 4, 1973	Planted 2 rows on 40" beds with 12" spacing
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 26, 1973	First emergence - Cultivated
Jan 7, 1974	Poor stand
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Transplanted for proper stand - Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 14

CHICK PEAS

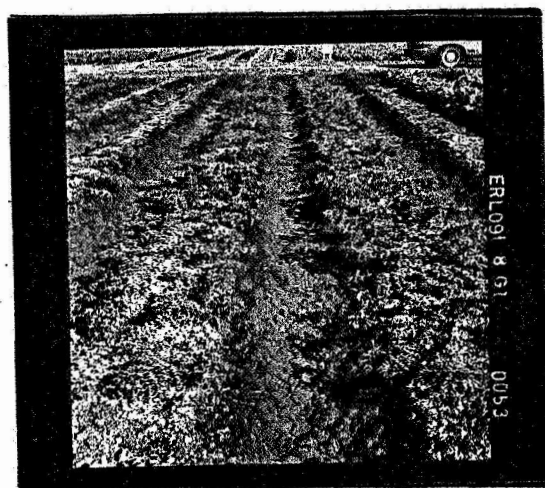
## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 12, 1973	-	-	Moist	-	-
Dec 18, 1973	-	0	Moist 1" down	-	-
Jan 3, 1974	1-2	2	Moist 1.5" down	Normal	-
Jan 10, 1974	2.5	3	Moist .5" down	Normal	Poor stand
Jan 14, 1974	4	6	Wet	Normal	Transplanted for
Jan 25, 1974	4	10	Moist 1" down	Normal	good stand
					Salt on rows -
Jan 30, 1974	5	8	Moist 2" down	Normal	Jan 21, 1974
Feb 7, 1974	7	20	Wet	Normal	-
					Irrigated Feb 4,
					no weeds

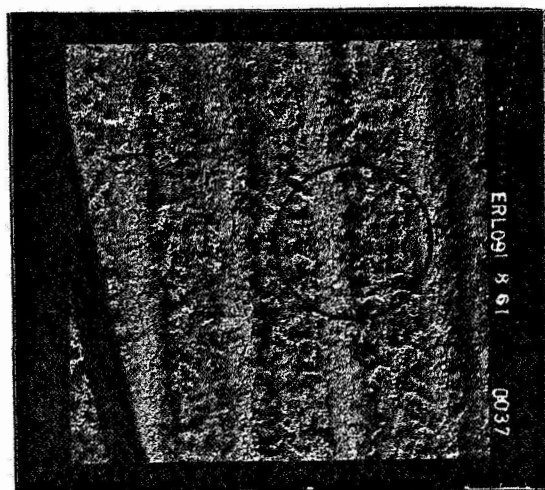
PLOT NO. 14

CHICK PEAS

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

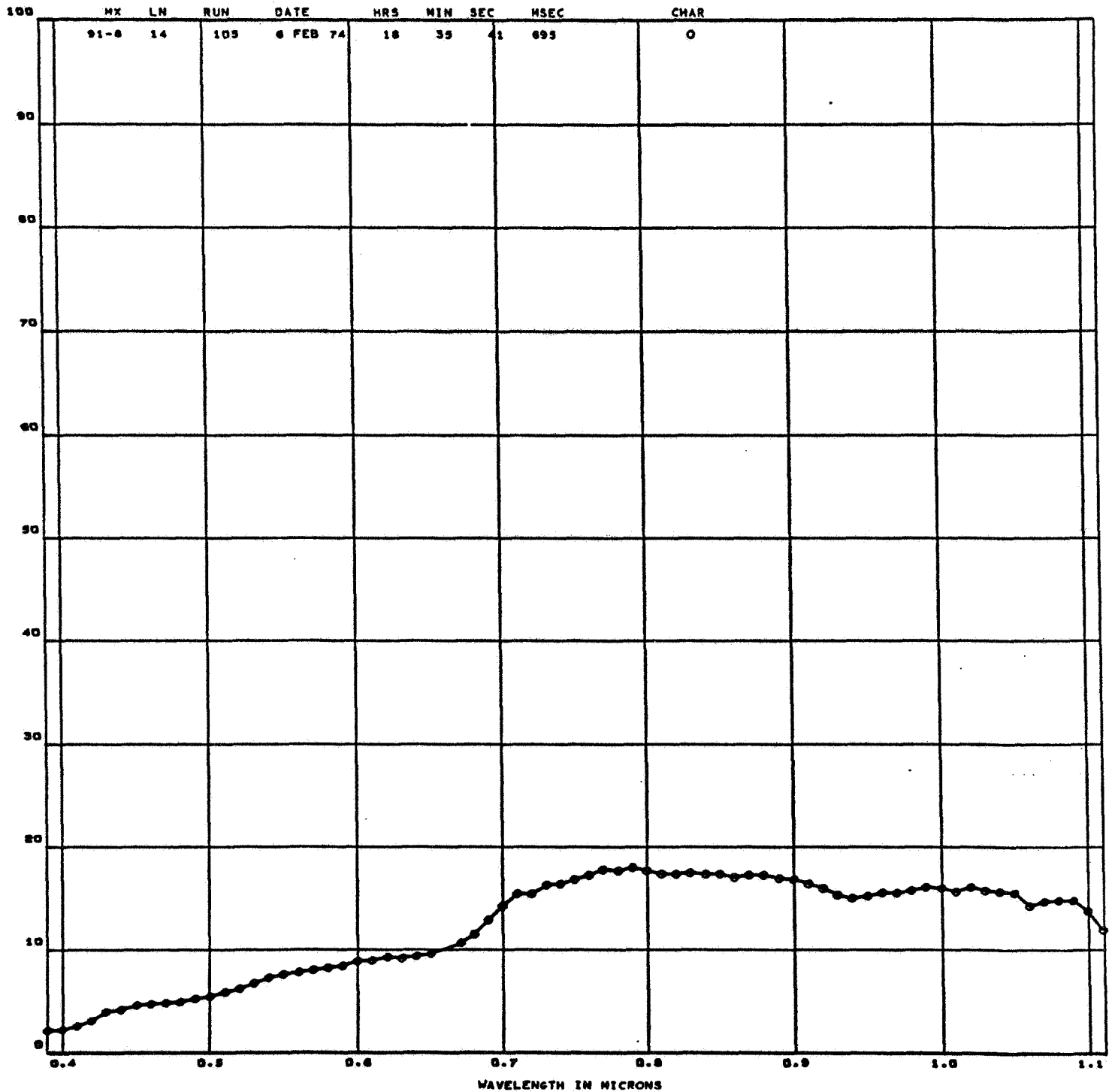
Circle represents spectrometer footprint

PLOT NO. 14

CHICK PEAS

SPECTROMETER SIGNATURE

U1100/SC4020  
0010 0000





PLOT NO. 15

POPPY - 2  
(Acquisition No. M-89)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 9" spacing in drill
Nov 9, 1973	Irrigated
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 9"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 15

POPPY-2  
(Acquisition No. M-89)

GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	1	Moist 1" down	Wilted	Thinned Dec 17
Jan 3, 1974	1.5	5	Moist 1.5" down	Normal	-
Jan 10, 1974	2	10	Moist .5" down	Normal	-
Jan 14, 1974	3	22	Wet	Normal	-
Jan 25, 1974	5	23	Moist 1" down	Normal	Salt on rows - Jan 21, 1974, tens. =15
Jan 30, 1974	6	25	Moist 2" down	Normal	
Feb 7, 1974	8	45	Wet	Normal	Irrigated Feb 4, no weeds, tens. =38

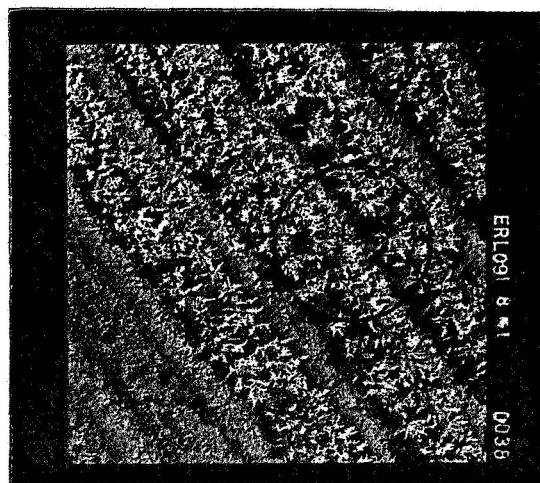
PLOT NO. 15

POPPY - 2

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

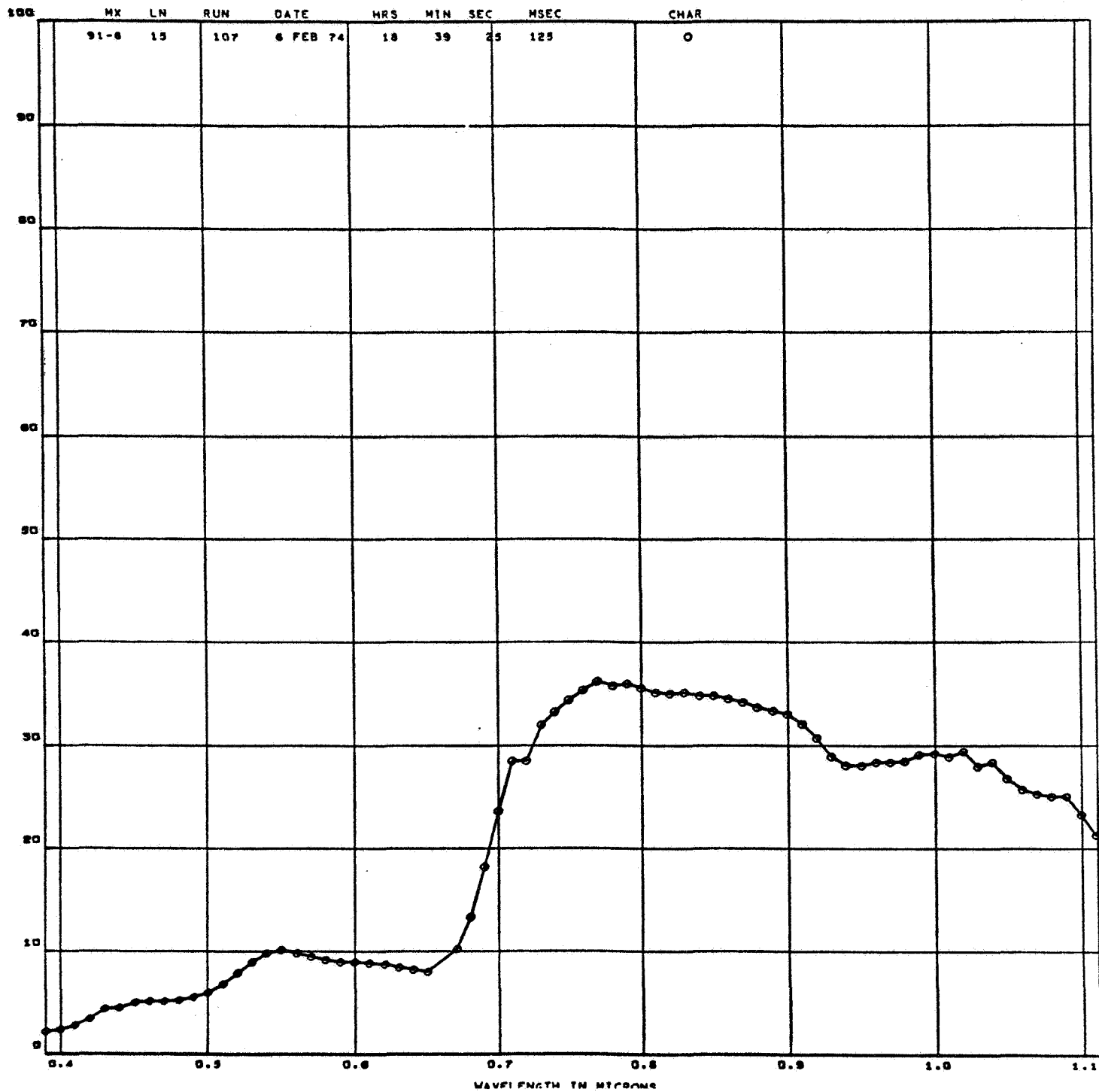
Circle represents spectrometer footprint

PLOT NO. 15

POPPY -2

SPECTROMETER SIGNATURE

U1108/SC4020  
0019 0000



PLOT NO. 16

POPPY - 4  
(Mixture of Poppy 1,2,3)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 9" spacing in drill
Nov 9, 1973	Irrigated
Nov 13, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 9"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 16

POPPY-4  
(Mixture of 1,2,3 )

# GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 12, 1973	.5	-	Moist	Normal	-
Dec 18, 1973	1	1	Moist 1" down	Normal	Thinned Dec 12
Jan 3, 1974	1	3	Moist 1.5" down	Normal	-
Jan 10, 1974	2	10	Moist .5" down	Normal	-
Jan 14, 1974	2.5	20	Wet	Normal	-
Jan 25, 1974	4	20	Moist 1" down	Normal	Salt on rows - Jan 21, 1974
Jan 30, 1974	6	23	Moist 2" down	Normal	-
Feb 7, 1974	7	35	Wet	Normal	Irrigated Feb 4, no weeds

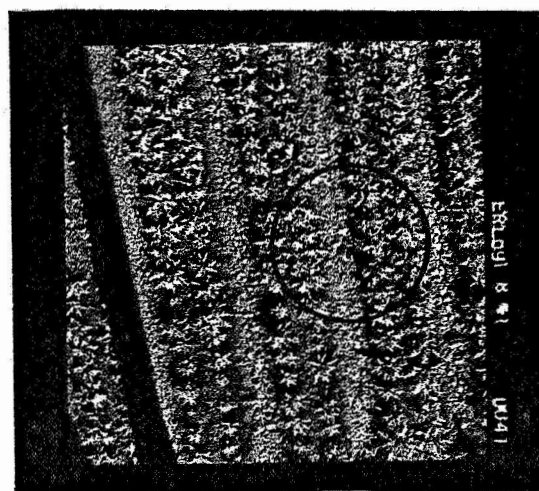
PLOT NO. 16

POPPY - 4

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

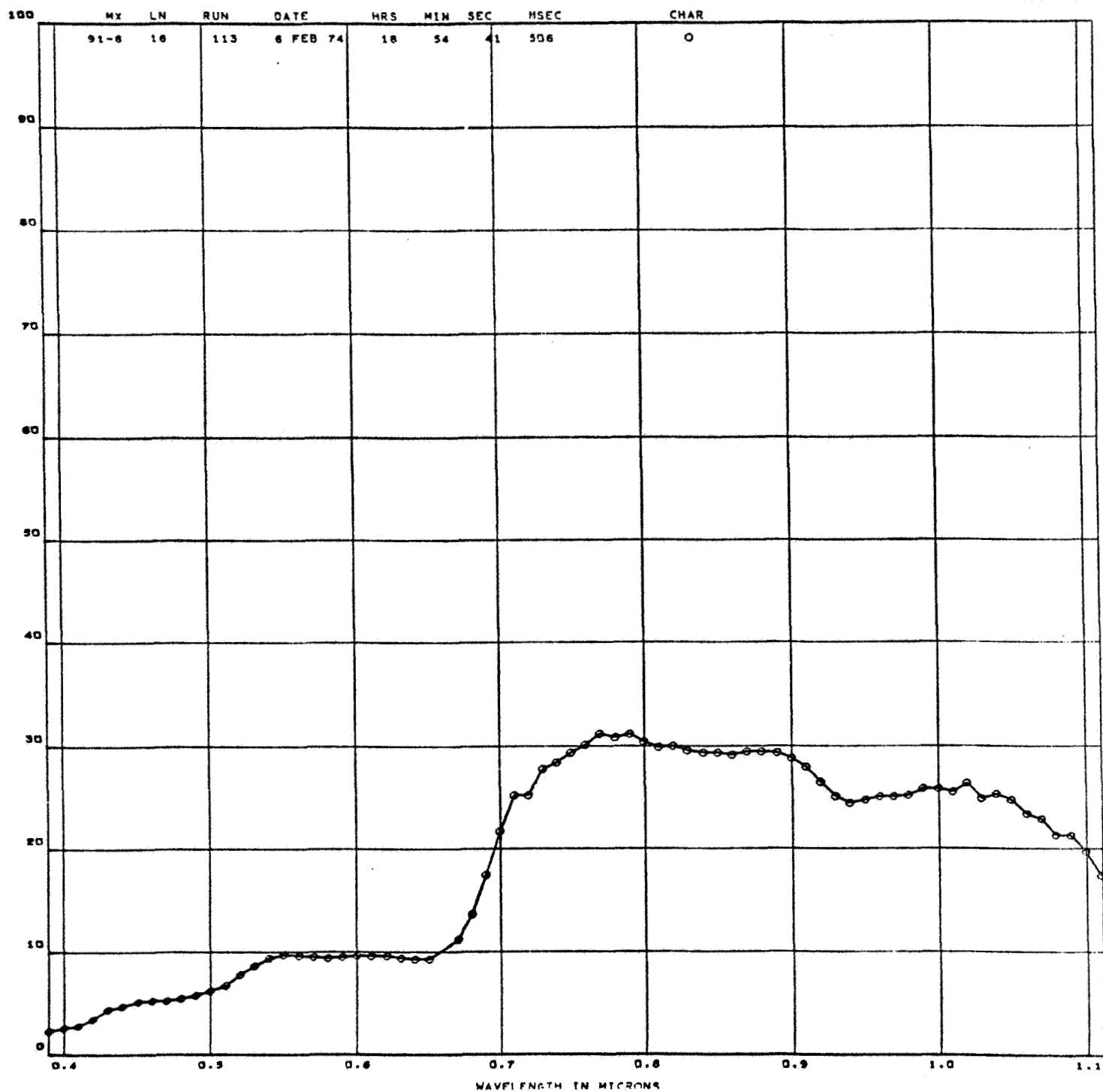
Circle represents spectrometer footprint

PLOT NO. 16

POPPY-4

SPECTROMETER SIGNATURE

U1108/3C4020  
0020 0000





PLOT NO. 17

POPPY - 6  
(Acquisition No. B-40-6-3)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 9" spacing in drill
Nov 9, 1973	Irrigated
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 9"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion
Feb 4, 1974	Irrigated

PLOT NO. 17

POPPY-6  
(Acquisition No. B-40-6-3)

## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	1	Moist 1" down	Wilted	Thinned Dec 12
Jan 3, 1974	1-2	4	Moist 1.5" down	Normal	-
Jan 10, 1974	2	10	Moist .5" down	Normal	-
Jan 14, 1974	2.5	20	Wet	Normal	-
Jan 25, 1974	5	22	Moist 1" down	Normal	Salt on rows Jan 21, 1974
Jan 30, 1974	6	35	Moist 2" down	Normal	-
Feb 7, 1974	7	30	Wet	Normal	No weeds

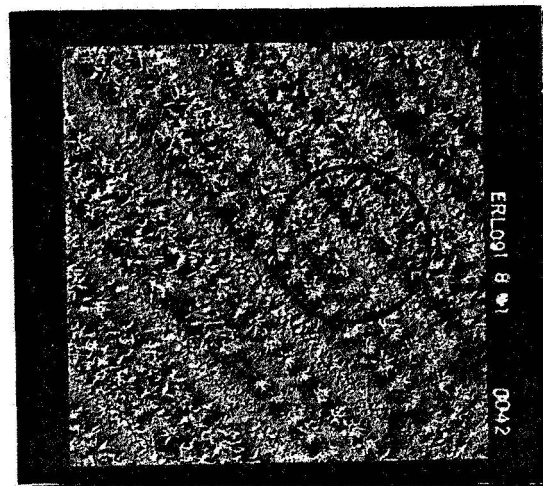
PLOT NO. 17

POPPY - 6

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

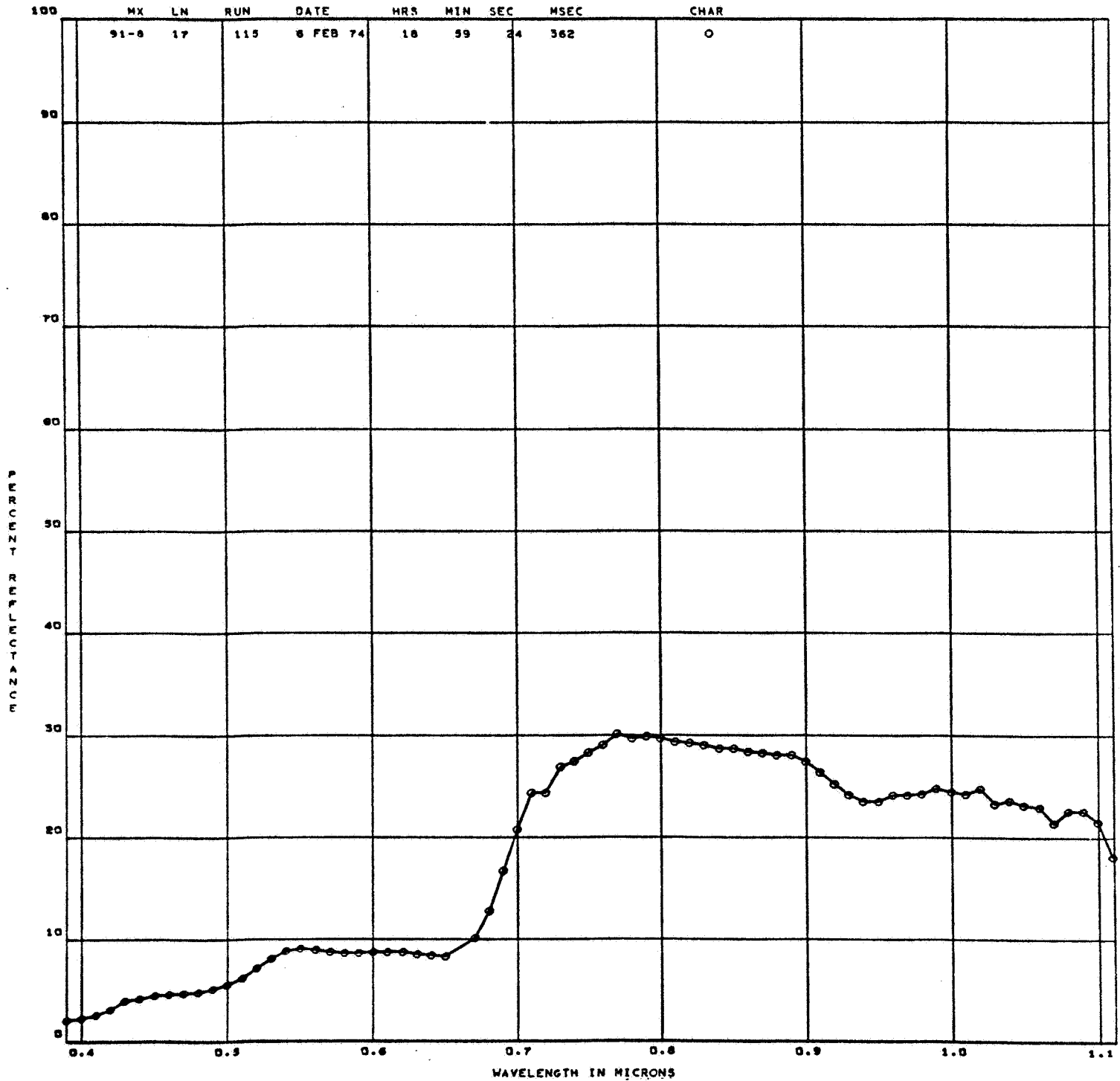
Circle represents spectrometer footprint

PLOT NO. 17

POPPY-6

SPECTROMETER SIGNATURE

U1108/SC4020  
0021 0000



PLOT NO. 23

CABBAGE

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing
Nov 9, 1973	Irrigated
Nov 12, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 12"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 23

CABBAGE

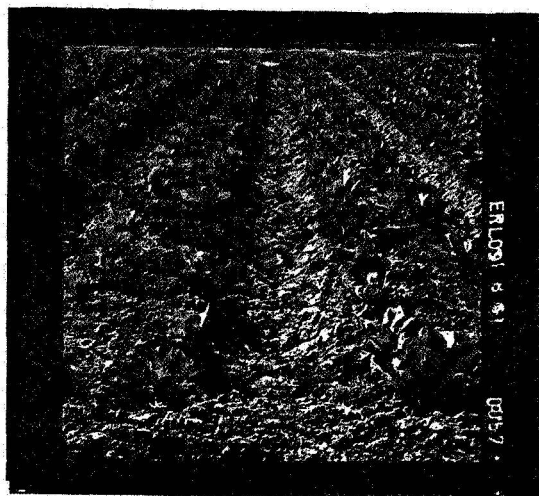
## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	1	Moist 1" down	Wilted	Thinned Dec 17
Jan 3, 1974	3-4	2	Moist 1.5" down	Normal	-
Jan 10, 1974	5	17	Moist .5" down	Normal	-
Jan 14, 1974	5	20	Wet	Normal	-
Jan 25, 1974	5	17	Moist 3" down	Normal	Salt on rows - Jan 21, 1974
Jan 30, 1974	5	15	Moist 2" down	Normal	-
Feb 7, 1974	6	20	Dry	Normal	No weeds

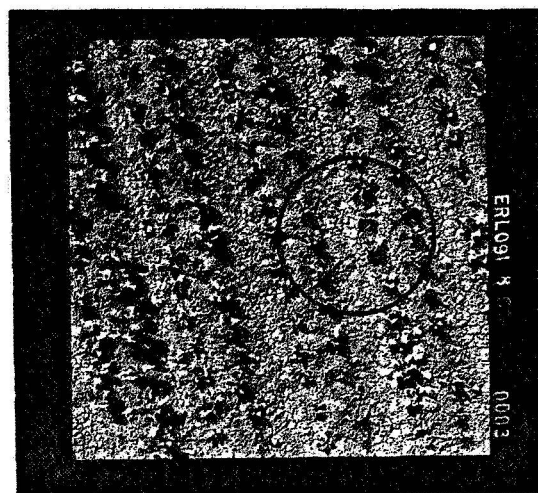
PLOT NO. 23

CABBAGE

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

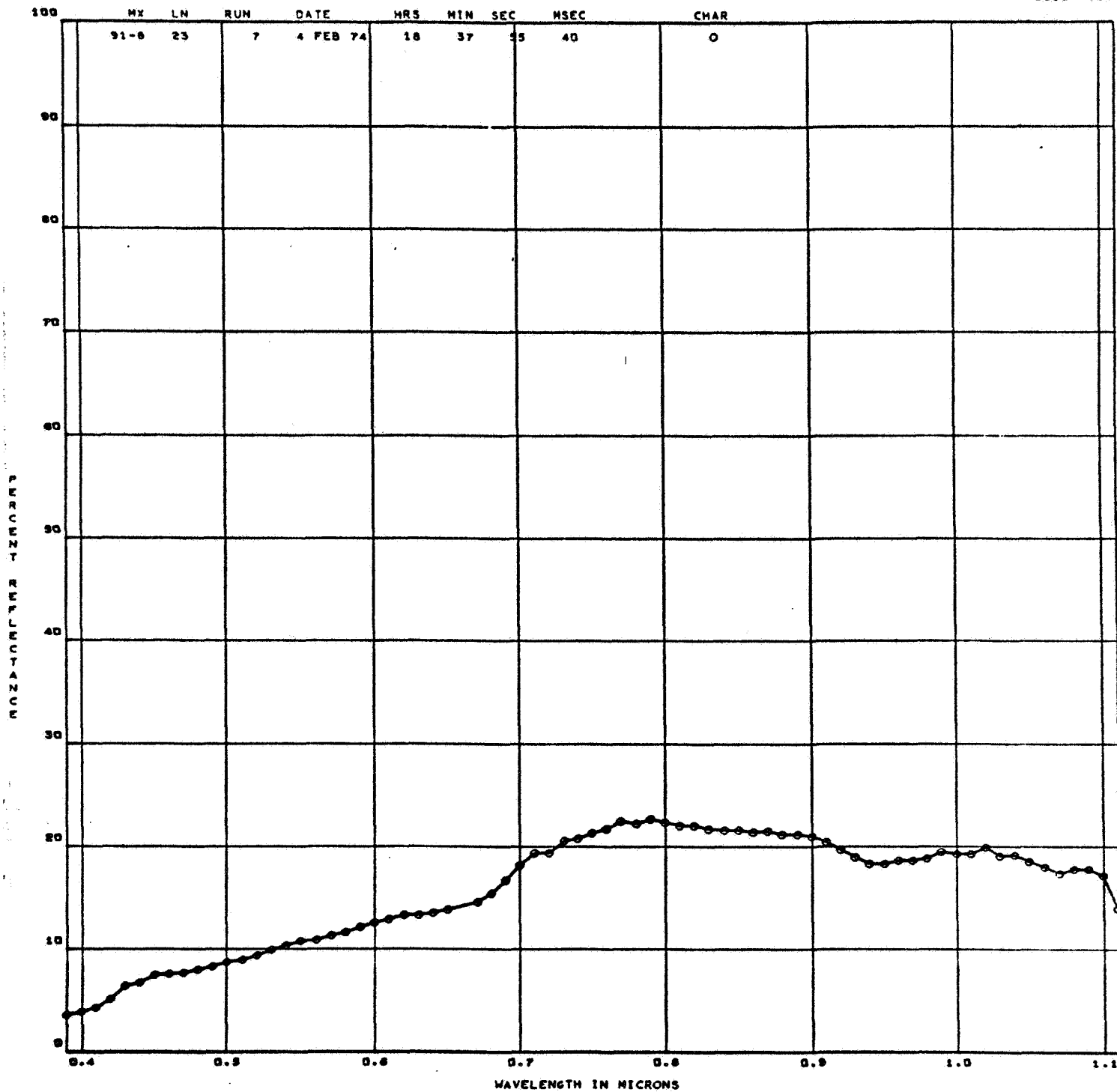
Circle represents spectrometer footprint

PLOT NO. 23

CABBAGE

SPECTROMETER SIGNATURE

U1100/SC4020  
0010 0000





PLOT NO. 24

BROCCOLI

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing
Nov 9, 1973	Irrigated
Nov 12, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 14"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 24

BROCCOLI

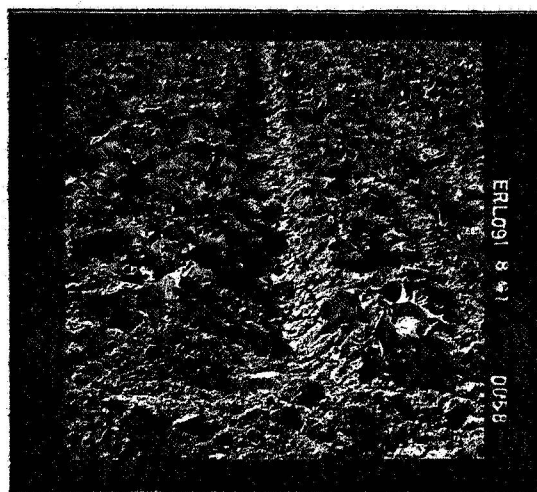
## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	1	Moist 1" down	Wilted	Thinned Dec 17
Jan 3, 1974	3	1	Moist 1.5" down	Normal	-
Jan 10, 1974	5	15	Moist 1.5" down	Normal	-
Jan 14, 1974	6	18	Wet	Normal	-
Jan 25, 1974	5	17	Moist 3" down	Normal	Tens.= 3 5% weeds Salt on rows Jan 21, 1974
Jan 30, 1974	7	17	Moist 2" down	Normal	-
Feb 7, 1974	8	20	Dry	Normal	No weeds, tens.=30

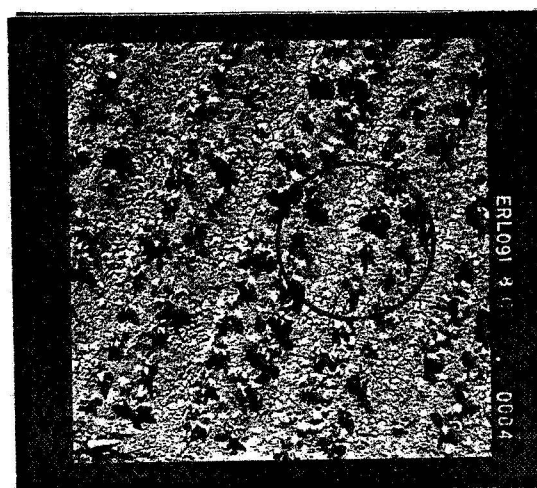
PLOT NO. 24

BROCCOLI

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

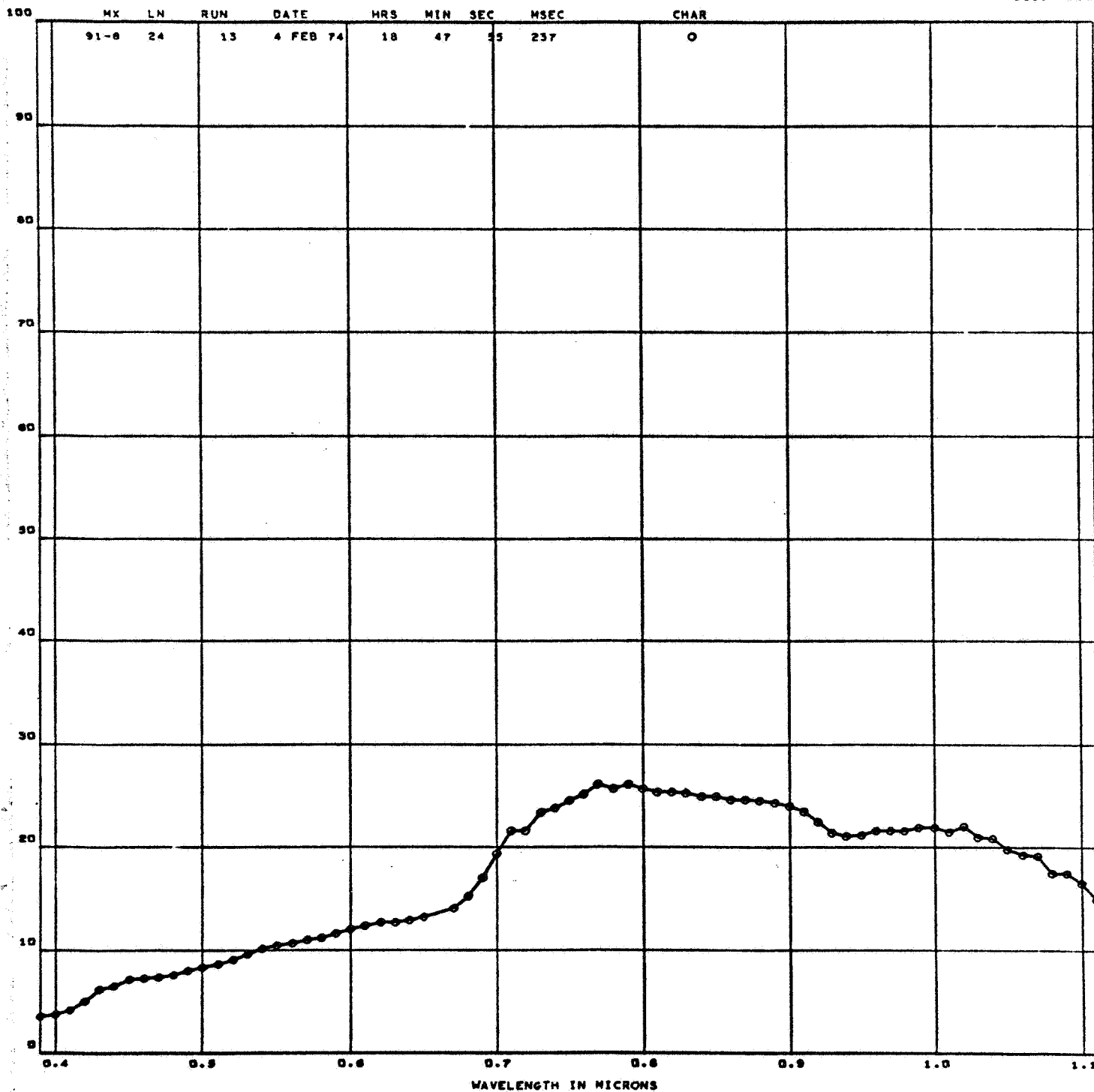
Circle represents spectrometer footprint

PLOT NO. 26

BROCCOLI

SPECTROMETER SIGNATURE

U1108/SC4020  
0011 0000



PLOT NO. 25

ONIONS

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 4 rows on 40" beds with 4-8-4" spacing
Nov 9, 1973	Irrigated
Nov 21, 1973	Irrigated
Nov 26, 1973	First emergence
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Hand weeded - Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 25

ONIONS

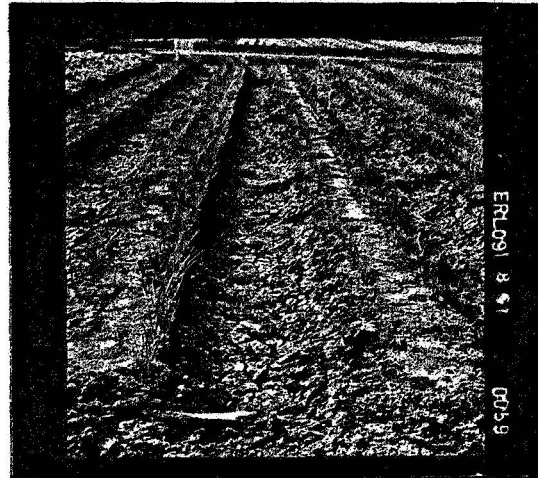
## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	3	Moist 1" down	Sprouts emerging	-
Jan 3, 1974	2-3	4	Moist 1.5" down	Normal	-
Jan 10, 1974	3	15	Moist .5" down	Normal	5% Weeds
Jan 14, 1974	4	8	Wet	Normal	Thinned and weeded Jan 14, 1974
Jan 25, 1974	6	8	Moist 3" down	Normal	Salt on rows - Jan 21, 1974
Jan 30, 1974	7	10	Moist 2" down	Normal	-
Feb 7, 1974	7	10	Dry	Normal	No weeds

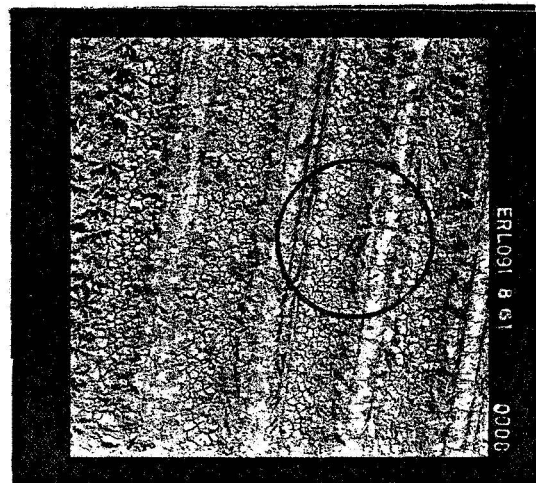
PLOT NO. 25

ONIONS

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

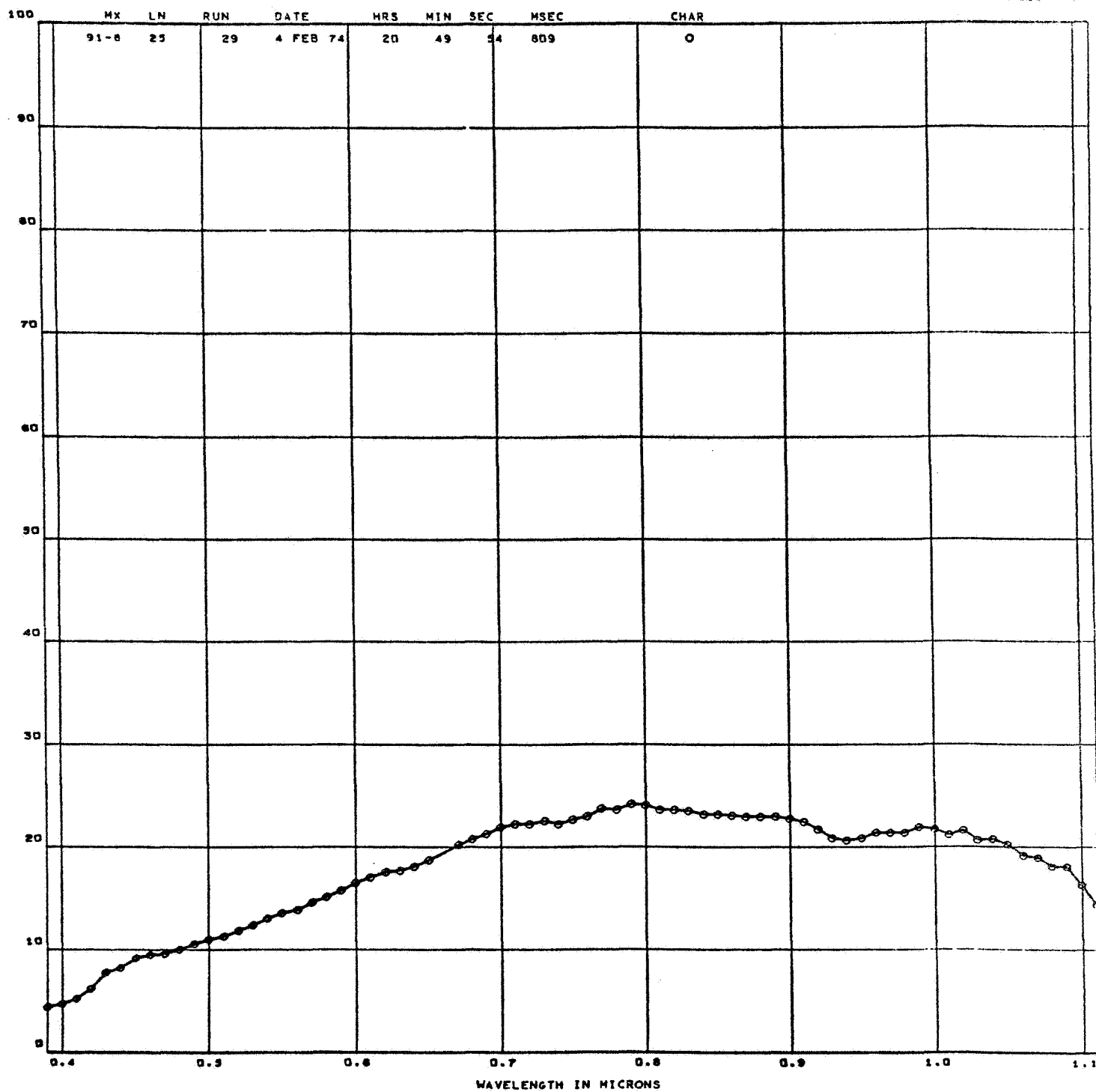
Circle represents spectrometer footprint

PLOT NO. 25

ONIONS

SPECTROMETER SIGNATURE

U1108/JC4020  
0012 0000





PLOT NO. 26

POPPY - 1  
(Acquisition No. B-40-6-3)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 9" spacing in drill
Nov 9, 1973	Irrigated
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 9"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 26

POPPY-1  
(Acquisition No. B-40-6-3)

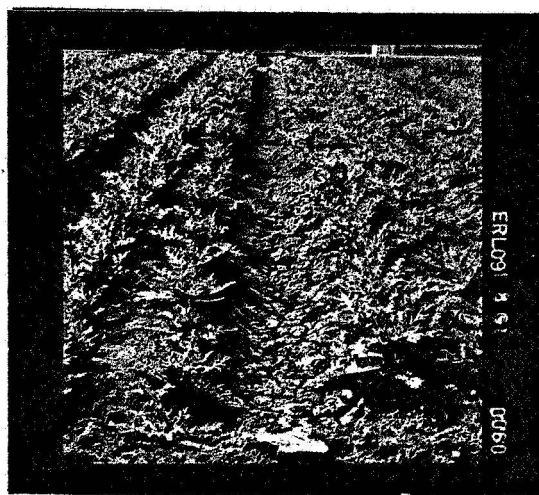
## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	1	Moist 1" down	Wilted	Thinned Dec 17
Jan 3, 1974	1-1.5	4	Moist 1.5" down	Normal	-
Jan 10, 1974	2	12	Moist .5" down	Normal	-
Jan 14, 1974	3	22	Wet	Normal	-
Jan 25, 1974	4	15	Moist 3" down	Normal	Tens. = 11 Salt on rows - Jan 21, 1974
Jan 30, 1974	6	18	Moist 2" down	Normal	-
Feb 7, 1974	8	30	Dry	Normal	No weeds, tens.=50

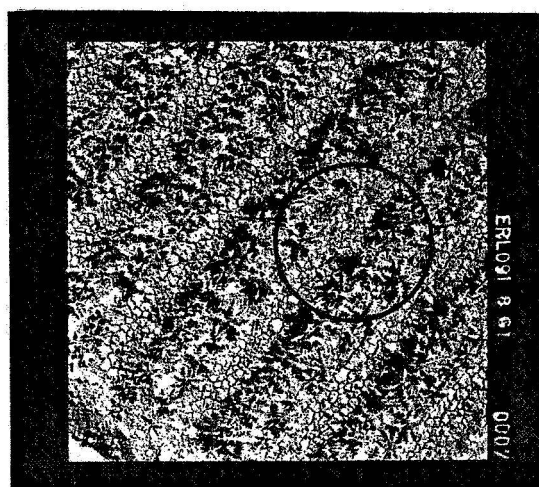
PLOT NO. 26

POPPY - 1

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

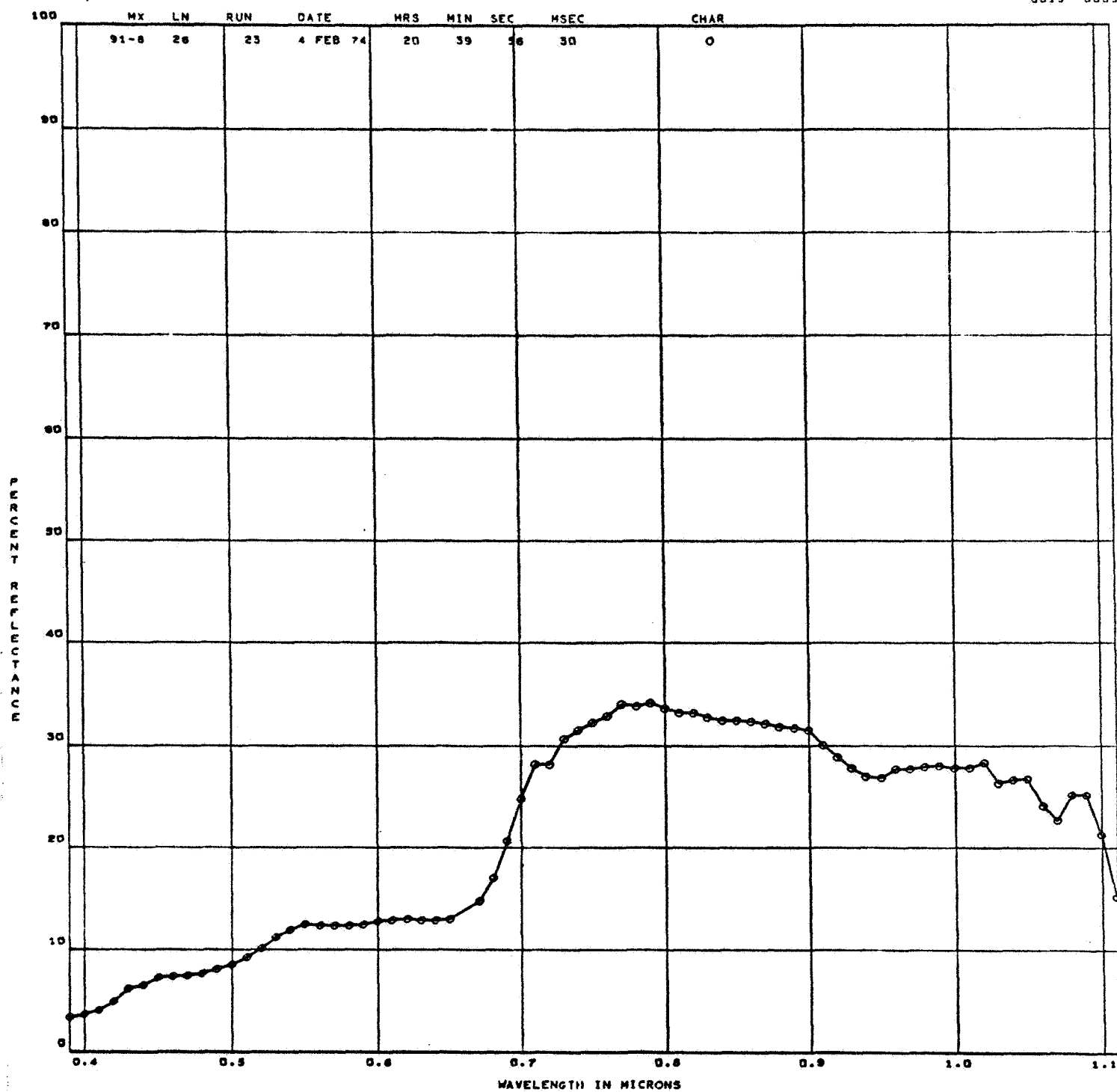
Circle represents spectrometer footprint

PLOT NO. 26

POPPY-1

SPECTROMETER SIGNATURE

U1108/SC4020  
0013 0009



PLOT NO. 27

POPPY - 3  
(Aquisition No. 371923)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 9" spacing in drill
Nov 9, 1973	Irrigated
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 9"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 27

POPPY-3  
(Acquisition No. 371923)

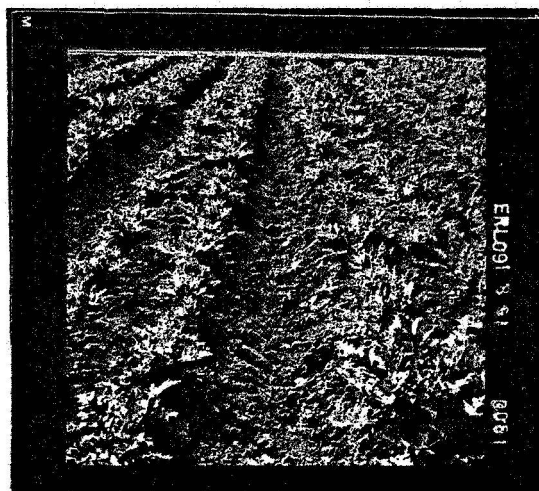
GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	1	Moist 1" down	Wilted	Thinned Dec 17
Jan 3, 1974	1	2	-	Normal	-
Jan 10, 1974	2	12	Moist .5" down	Normal	Few weeds
Jan 14, 1974	3	22	Wet	Normal	-
Jan 25, 1974	4	20	Moist 3" down	Normal	1% weeds
					Salt on rows -
					Jan 21, 1974
Jan 30, 1974	4	15	Moist 2" down	Normal	-
Feb 7, 1974	5	25	Dry	Normal	No weeds

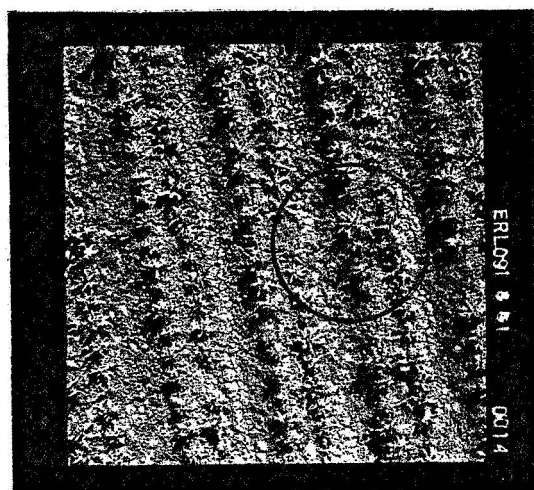
PLOT NO. 27

POPPY - 3

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

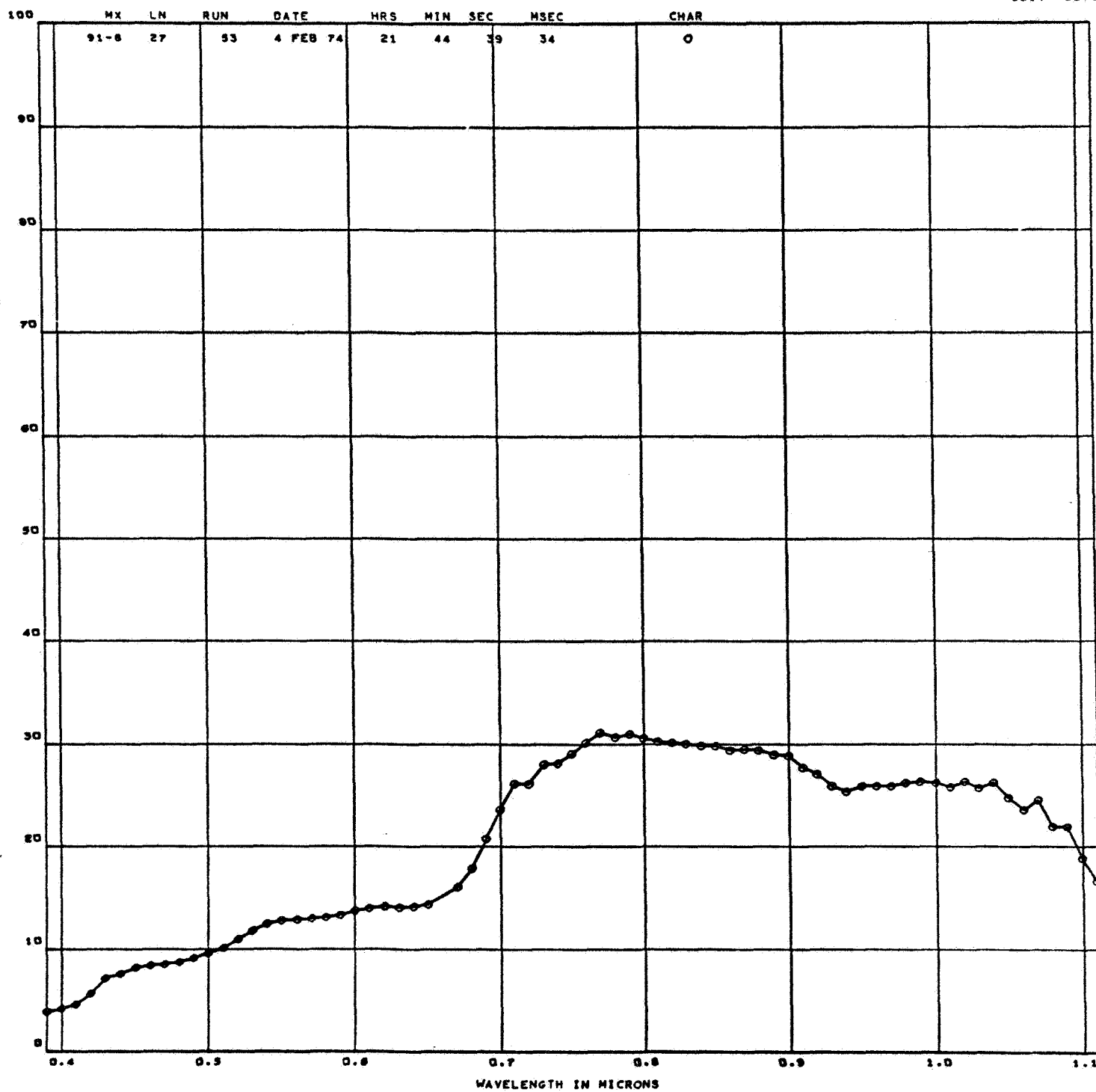
Circle represents spectrometer footprint

PLOT NO. 27

POPPY-3

SPECTROMETER SIGNATURE

U1108/SC4020  
0014 0000





PLOT NO. 28

POPPY - 6  
(Acquisition No. B-40-5-5)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 9" spacing in drill
Nov 9, 1973	Irrigated
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 9"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 28

POPPY-6  
(Acquisition No. B-40-6-3)

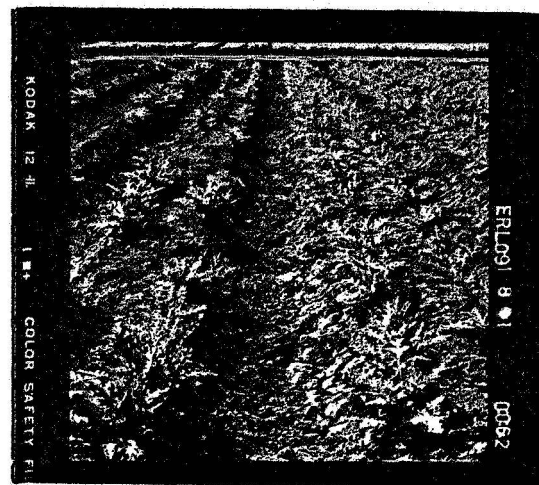
## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	1	Moist 1" down	Wilted	Thinned Dec 17
Jan 3, 1974	1	2	Moist 1.5" down	Normal	-
Jan 10, 1974	2	10	Moist .5" down	Normal	-
Jan 14, 1974	2.5	20	Wet	Normal	-
Jan 25, 1974	4	15	Moist 3" down	Normal	Salt on rows - Jan 21, 1974
Jan 30, 1974	4	15	Moist 2" down	Normal	Sparse crop
Feb 7, 1974	6	15	Dry	Normal	Poor stand, no weeds

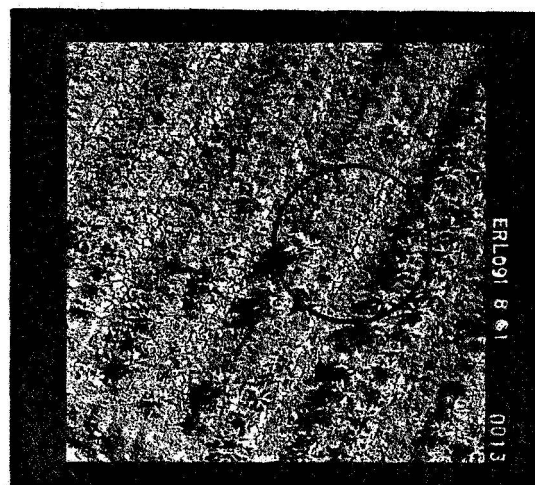
PLOT NO. 28

POPPY - 6

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

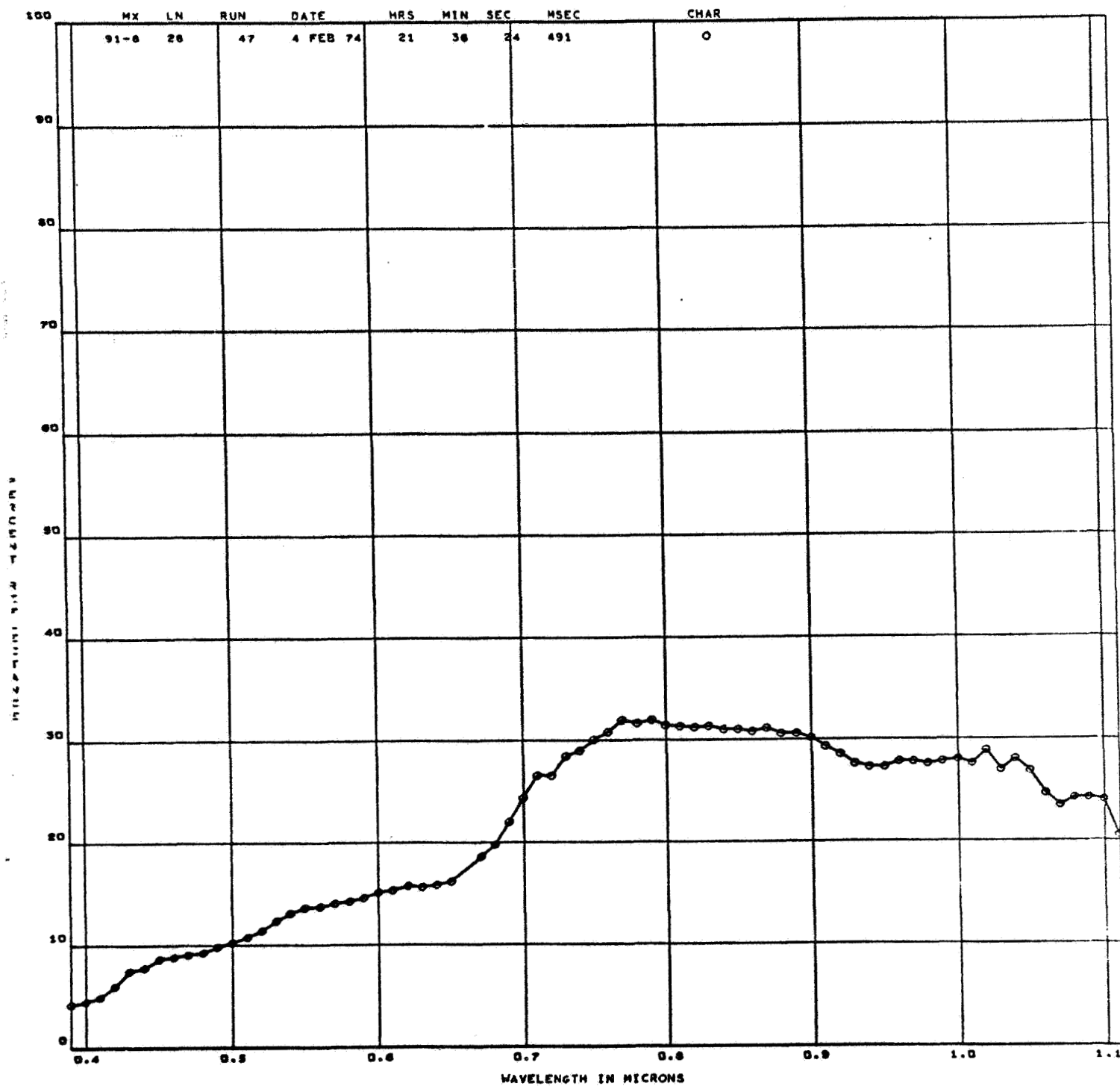
Circle represents spectrometer footprint

PLOT NO. 28

POPPY-6

SPECTROMETER SIGNATURE

U1108/SC4022  
0015 0000



## CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 24" spacing in drill
Nov 9, 1973	Irrigated
Nov 13, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 24"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 34

CAULIFLOWER

## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	1	Moist 1" down	Wilted	Thinned Dec 17
Jan 3, 1974	2	2	Moist 1.5" down	Normal	-
Jan 10, 1974	6	12	Moist .5" down	Normal	-
Jan 14, 1974	6.5	15	Wet	Normal	-
Jan 25, 1974	8	20	Moist 3" down	Normal	2% weeds
					Salt on rows -
					Jan 21, 1974
Jan 30, 1974	9	20	Moist 2" down	Normal	-
Feb 7, 1974	12	30	Dry	Normal	No weeds

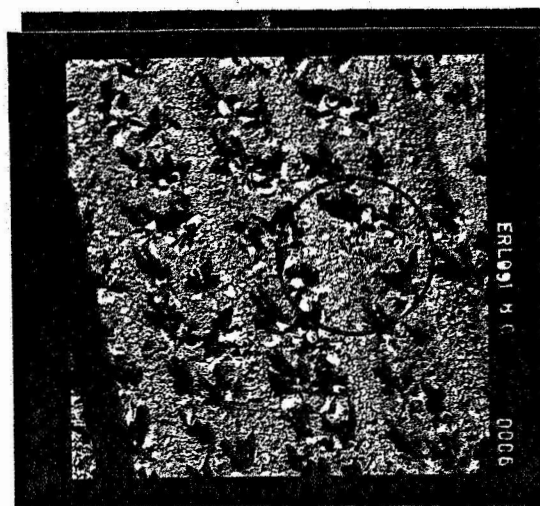
PLOT NO. 34

CAULIFLOWER

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

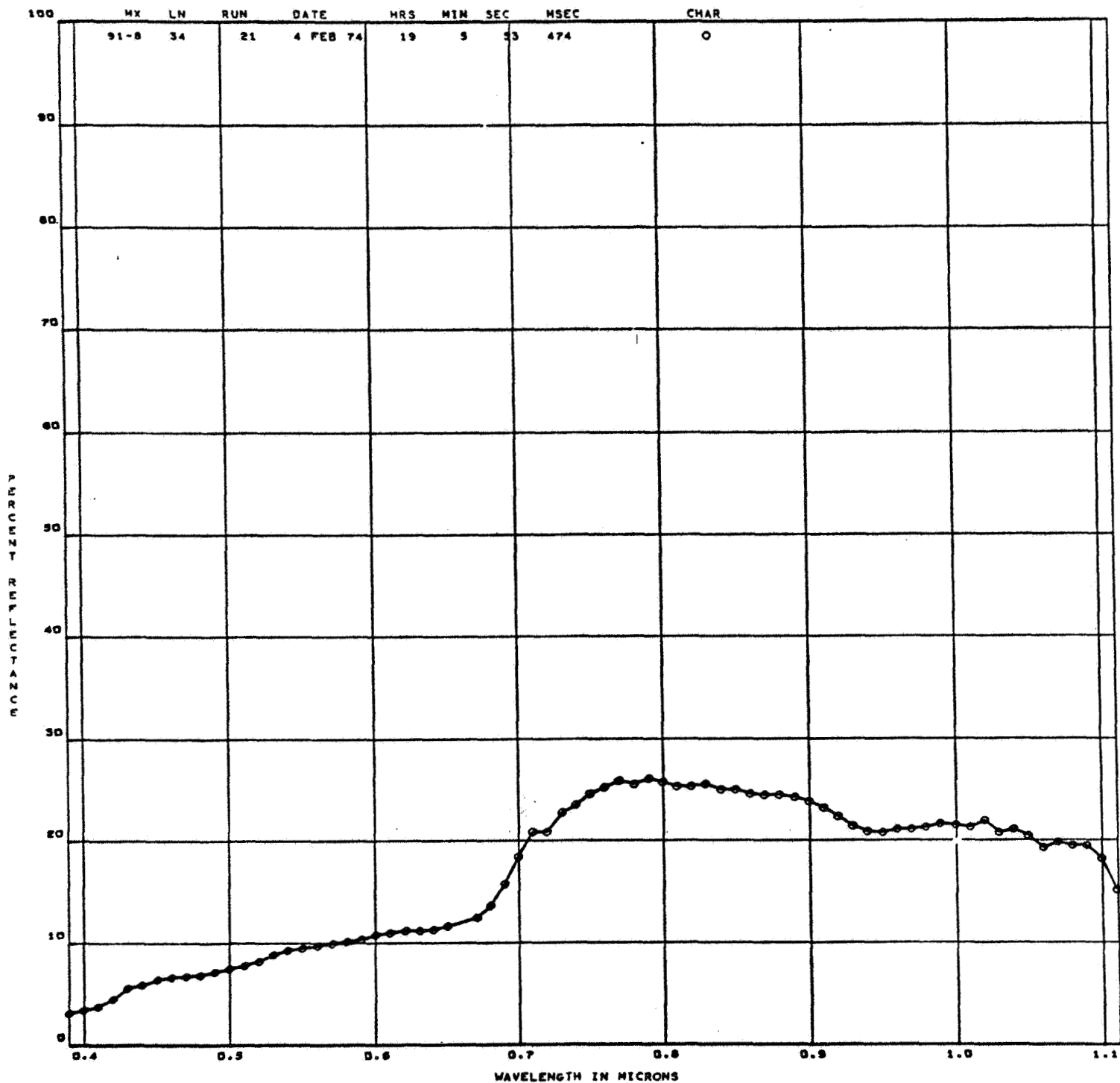
Circle represents spectrometer footprint

PLOT NO. 34

CAULIFLOWER

SPECTROMETER SIGNATURE

U1108/SC4020  
0016 0000





PLOT NO. 35

CARROT

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 4 rows on 40" beds with 4-8-4 " spacing
Nov 9, 1973	Irrigated
Nov 21, 1973	Irrigated
Nov 26, 1973	First emergence
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated - Sprayed with Lorax
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 35

CARROT

## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	1	Moist 1" down	Sprouts emerged	-
Jan 3, 1974	-	-	Moist 1" down	-	-
Jan 10, 1974	2	30	Moist .5" down	Normal	10% Weeds
Jan 14, 1974	2	20	Wet	Normal	7% Weeds
Jan 25, 1974	4	33	Moist 3" down	Normal	3% weeds
					Tens. = 8
					Salt on rows -
					Jan 21, 1974
Jan 30, 1974	4	30	Moist 2" down	Normal	-
Feb 7, 1974	4	33	Dry	Normal	No weeds, tens.=50

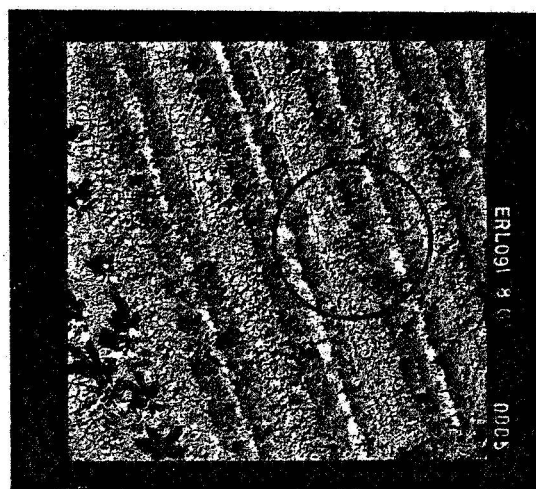
PLOT NO. 35

CARROT

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

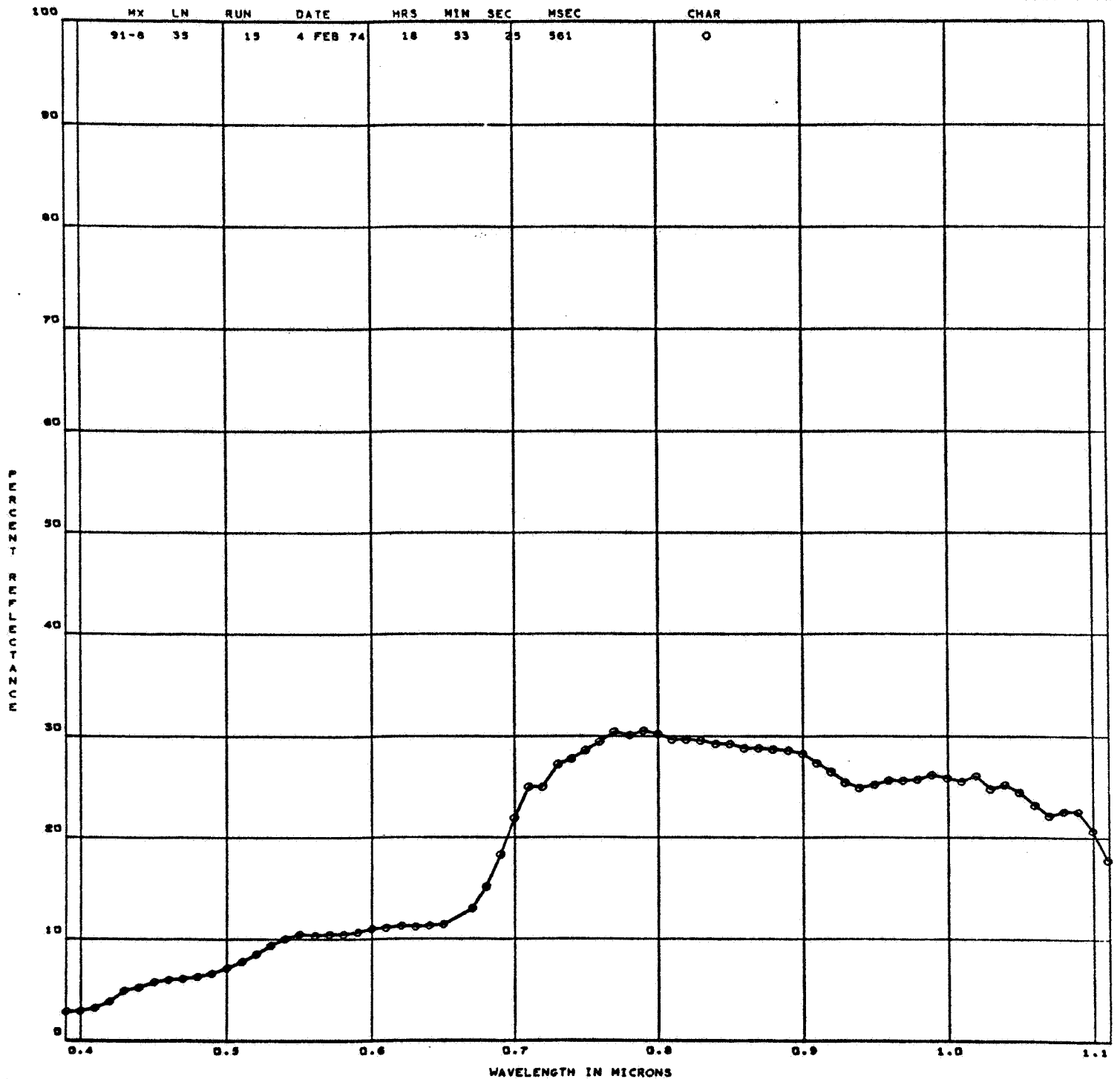
Circle represents spectrometer footprint

PLOT NO. 35

CARROT

SPECTROMETER SIGNATURE

U1108/SC4020  
0017 0000



PLOT NO. 36

CHICK PEAS

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Dec 4, 1973	Planted 2 rows on 40" beds with 12" spacing
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 26, 1973	First emergence
Jan 7, 1974	Poor stand
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Transplanted for proper stand - Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 36

CHICK PEAS

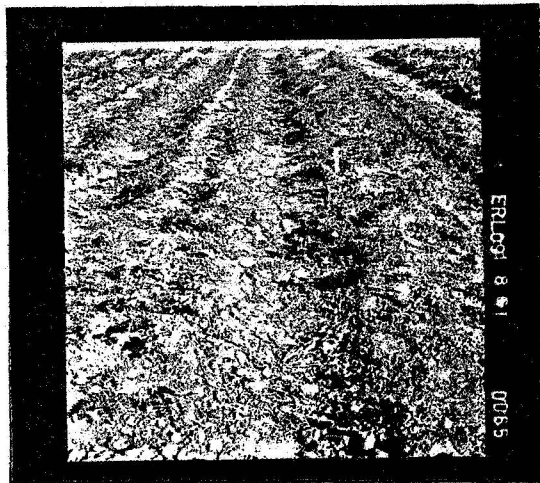
## GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	-	-	Moist 1" down	-	Not emerged
Jan 3, 1974	1	1	Moist 1.5" down	Normal	-
Jan 10, 1974	2.5	3	Moist .5" down	Normal	Poor stand
Jan 14, 1974	4	6	Wet	Normal	Transplanted for good stand
Jan 25, 1974	6	8	Moist 3" down	Normal	Salt on rows - Jan 21, 1974
Jan 30, 1974	6	7	Moist 2" down	Normal	-
Feb 7, 1974	7	20	Dry	Normal	No weeds

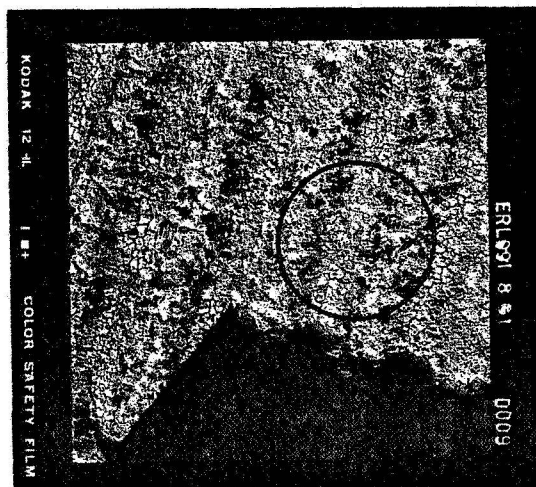
PLOT NO. 36

CHICK PEAS

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

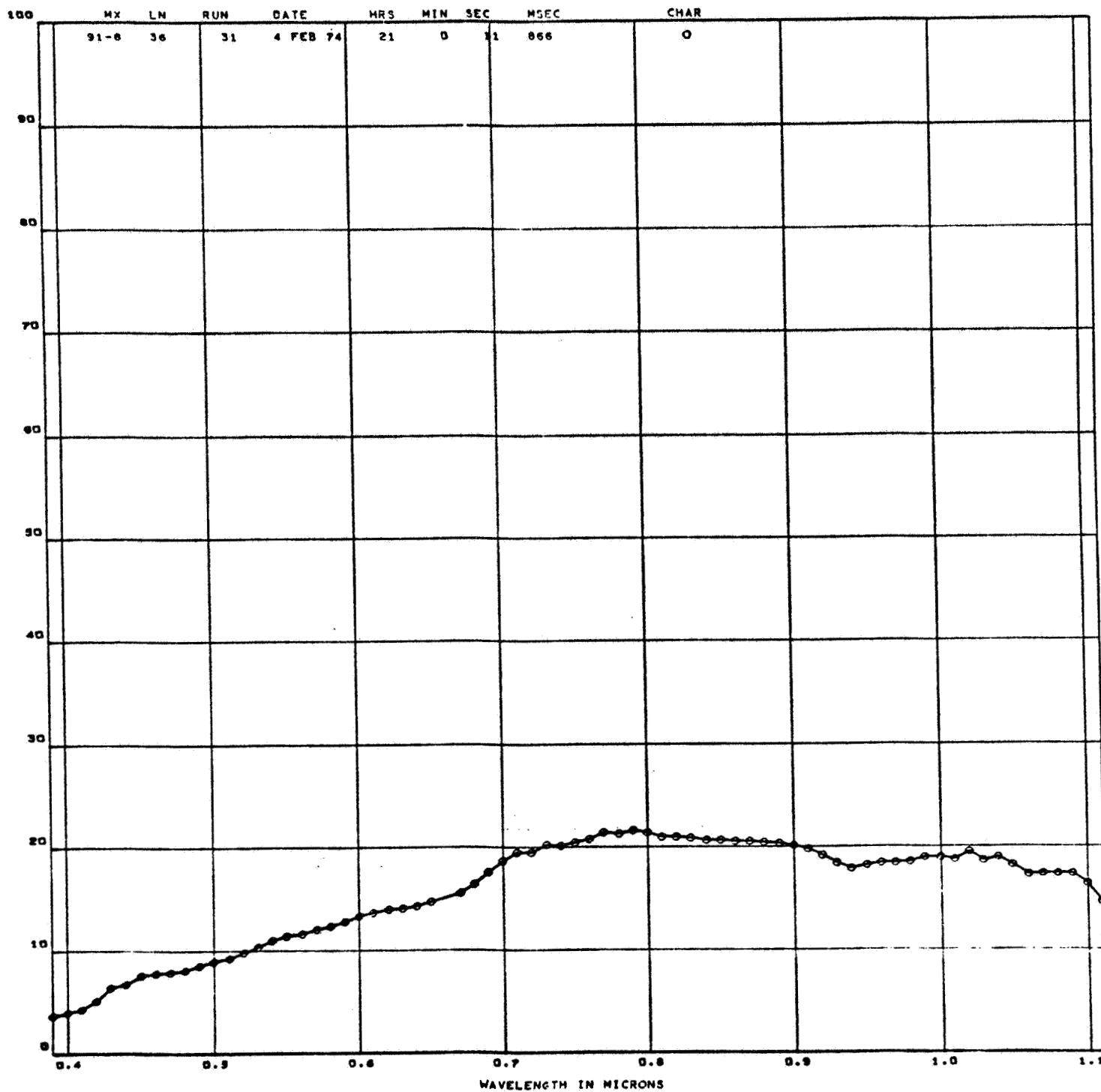
Circle represents spectrometer footprint

PLOT NO. 36

CHICK PEAS

SPECTROMETER SIGNATURE

U1108/SC4020  
0010 0000





PLOT NO. 37

POPPY -- 2  
(Acquisition No. M-89)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 9" spacing in drill
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 9"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 37

POPPY-2  
(Acquisition No. M-89)

# GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	1	Moist 1" down	Wilted	Thinned Dec 19.
Jan 3, 1974	1.5	2	Moist 1.5" down	Normal	-
Jan 10, 1974	2	10	Moist .5" down	Normal	-
Jan 14, 1974	3	22	Wet	Normal	-
Jan 25, 1974	4	15	Moist 3" down	Normal	5% weeds
					Salt on rows -
					Jan 21, 1974
Jan 30, 1974	6	15	Moist 2" down	Normal	-
Feb 7, 1974	7	30	Dry	Normal	No weeds

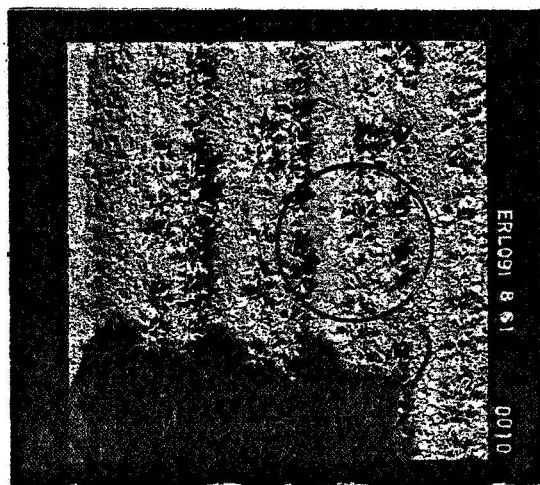
PLOT NO. 37

POPPY - 2

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

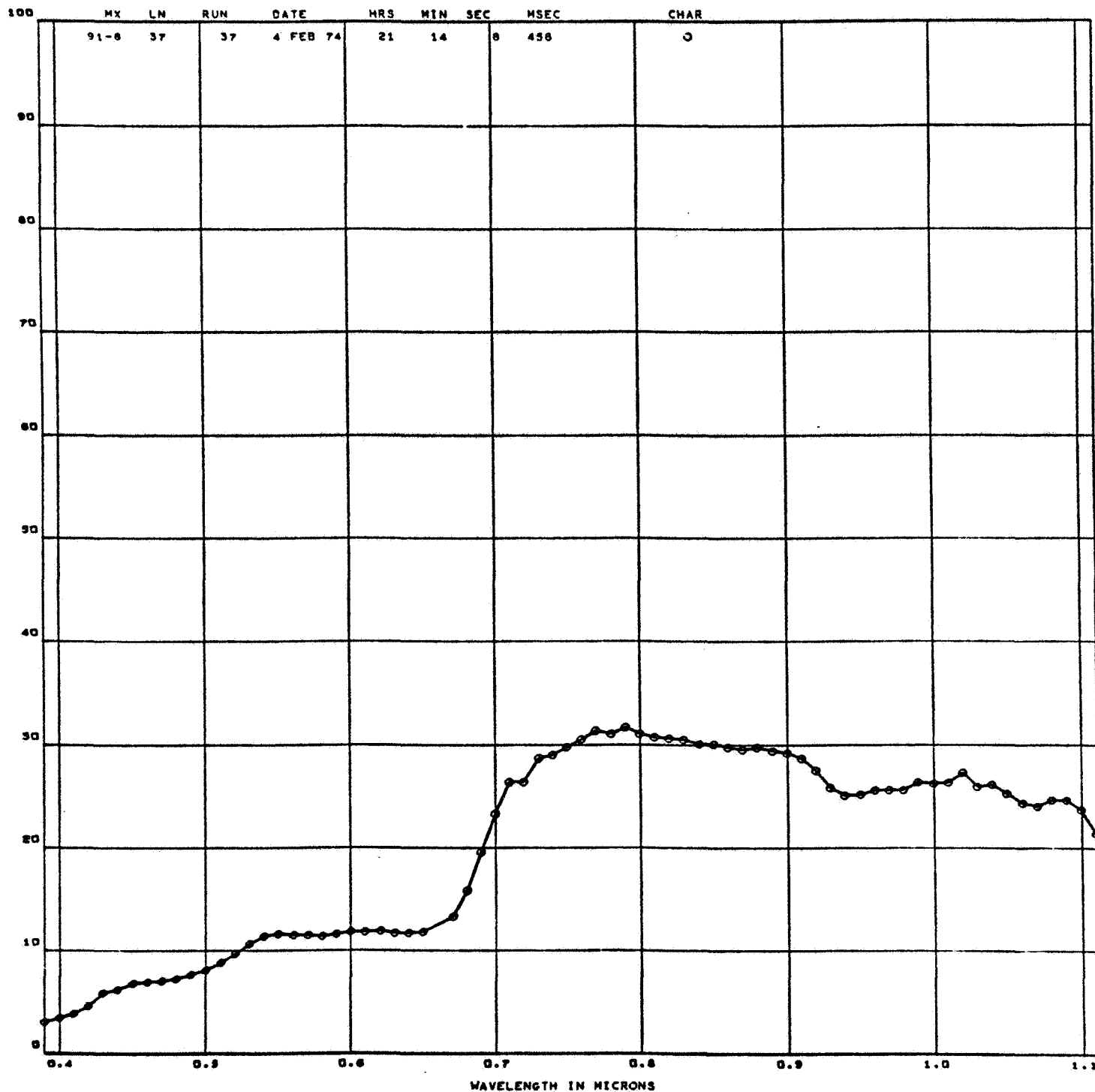
Circle represents spectrometer footprint

PLOT NO. 37

POPPY-2

SPECTROMETER SIGNATURE

U1100/SC4020  
0019 0000



PLOT NO. 38

POPPY  
(Mixture of 1, 2, 3)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 7, 1973	Planted 2 rows on 40" beds with 12" spacing and 9" spacing in drill
Nov 9, 1973	Irrigated
Nov 13, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned to 9"
Dec 26, 1973	Cultivated
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoeed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 38

POPPY-4  
(Mixture 1,2,3 )

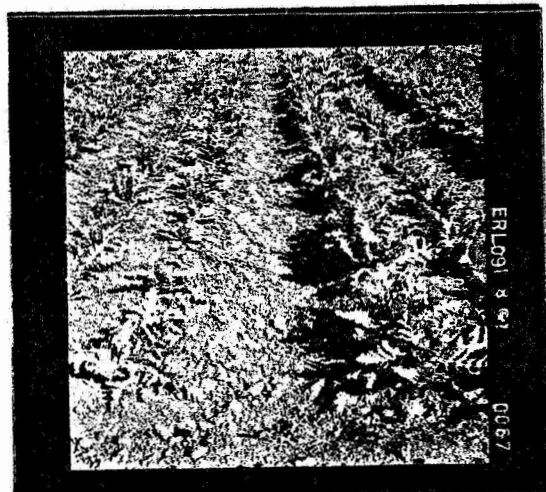
# GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	1	1	Moist 1" down	Wilted	Thinned Dec 17.
Jan 3, 1974	1.5	3	Moist 1.5" down	Normal	-
Jan 10, 1974	2	10	Moist .5" down	Normal	-
Jan 14, 1974	2.5	20	Wet	Wet	-
Jan 25, 1974	4	20	Moist 3" down	Normal	2% weeds Salt on rows - Jan 21, 1974
Jan 30, 1974	6	18	Moist 2" down	Normal	-
Feb 7, 1974	7	30	Dry	Normal	No weeds

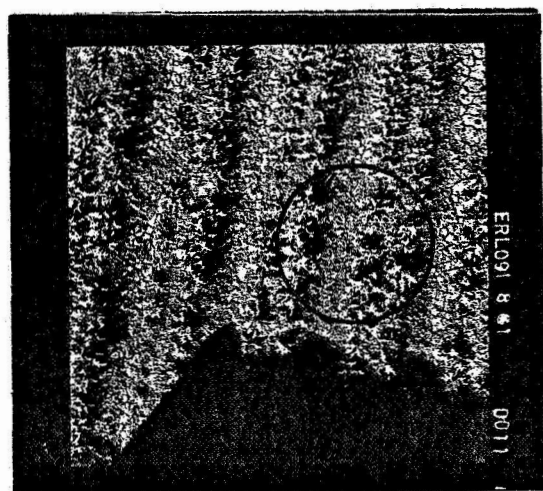
PLOT NO. 38

POPPY - 4

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

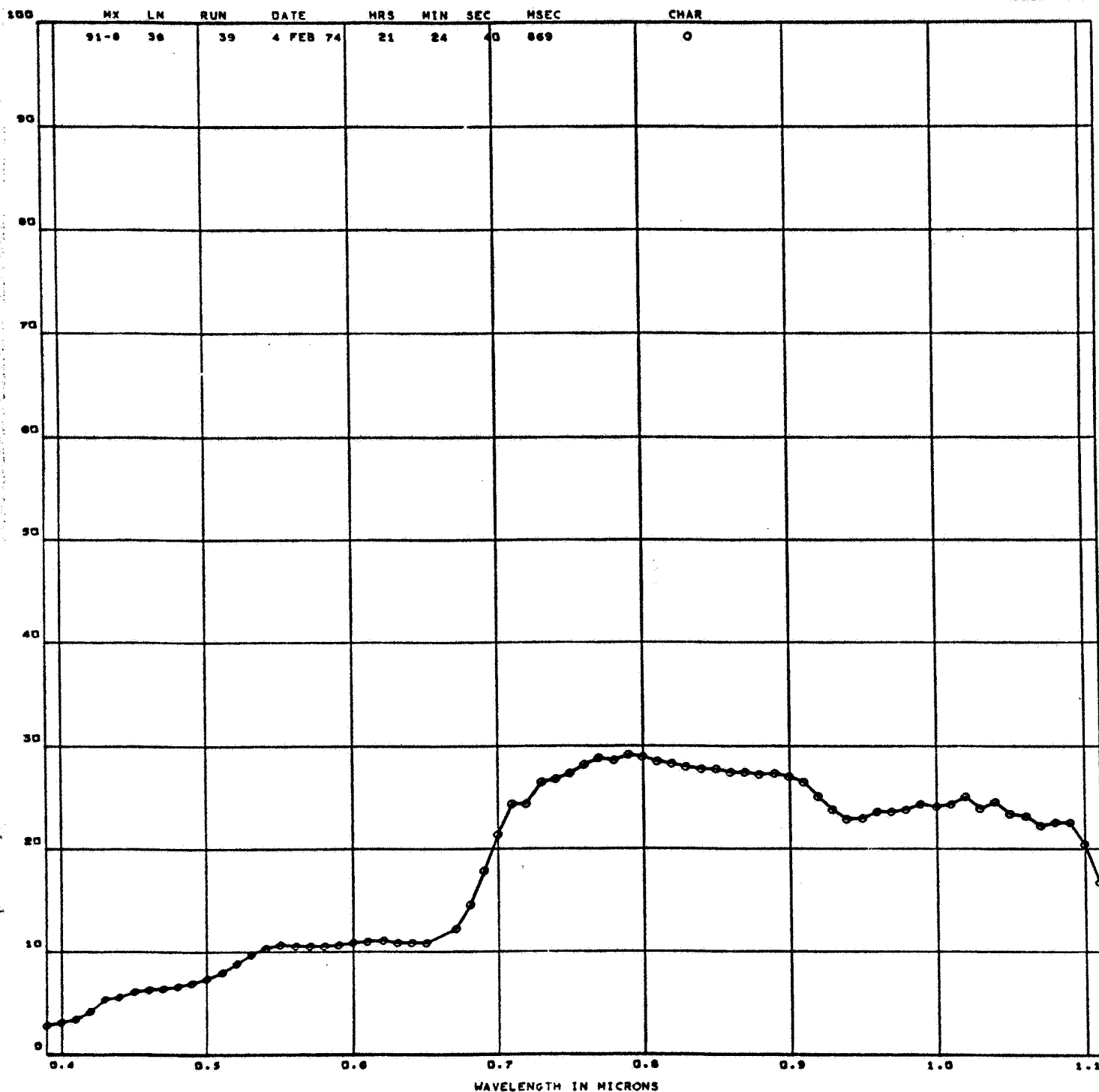
Circle represents spectrometer footprint

PLOT NO. 38

POPPY-4

SPECTROMETER SIGNATURE

U1106/5C4020  
0020 0000





PLOT NO. 39

BARE GROUND  
(DRY)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac
Nov 9, 1973	Irrigated
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 26, 1973	Cultivated
Jan 15, 1974	Irrigated
Jan 28, 1974	Hoeed weeds
Jan 29, 1974	Disced fallow portion

PLOT NO. 39

BARE GROUND  
(DRY)

GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Dec 18, 1973	-	-	Moist 1" down	-	-
Jan 3, 1974	-	-	Dry	-	No weeds
Jan 10, 1974	-	0	Moist .5" down	-	-
Jan 14, 1974	-	0	Dry	-	Not irrigated or cultivated
Jan 25, 1974	-	0	Moist 3" down	-	No weeds
					Salt on rows - Jan 21, 1974
Jan 30, 1974	-	-	Dry	-	-
Feb 7, 1974	-	-	-	-	No weeds

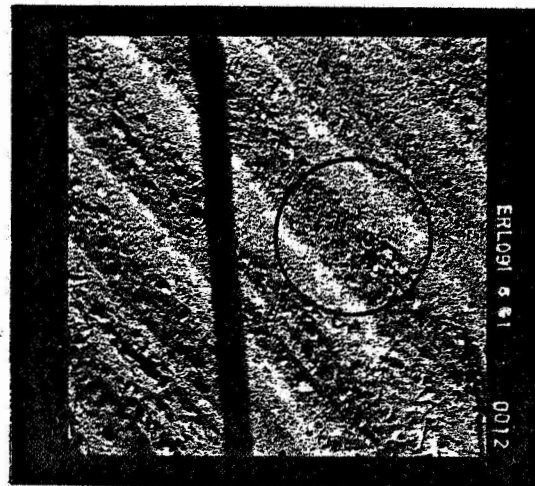
PLOT NO. 39

BARE GROUND  
( Dry )

FEBRUARY 4, 1974

NOT AVAILABLE

GROUND LEVEL



BORESIGHT

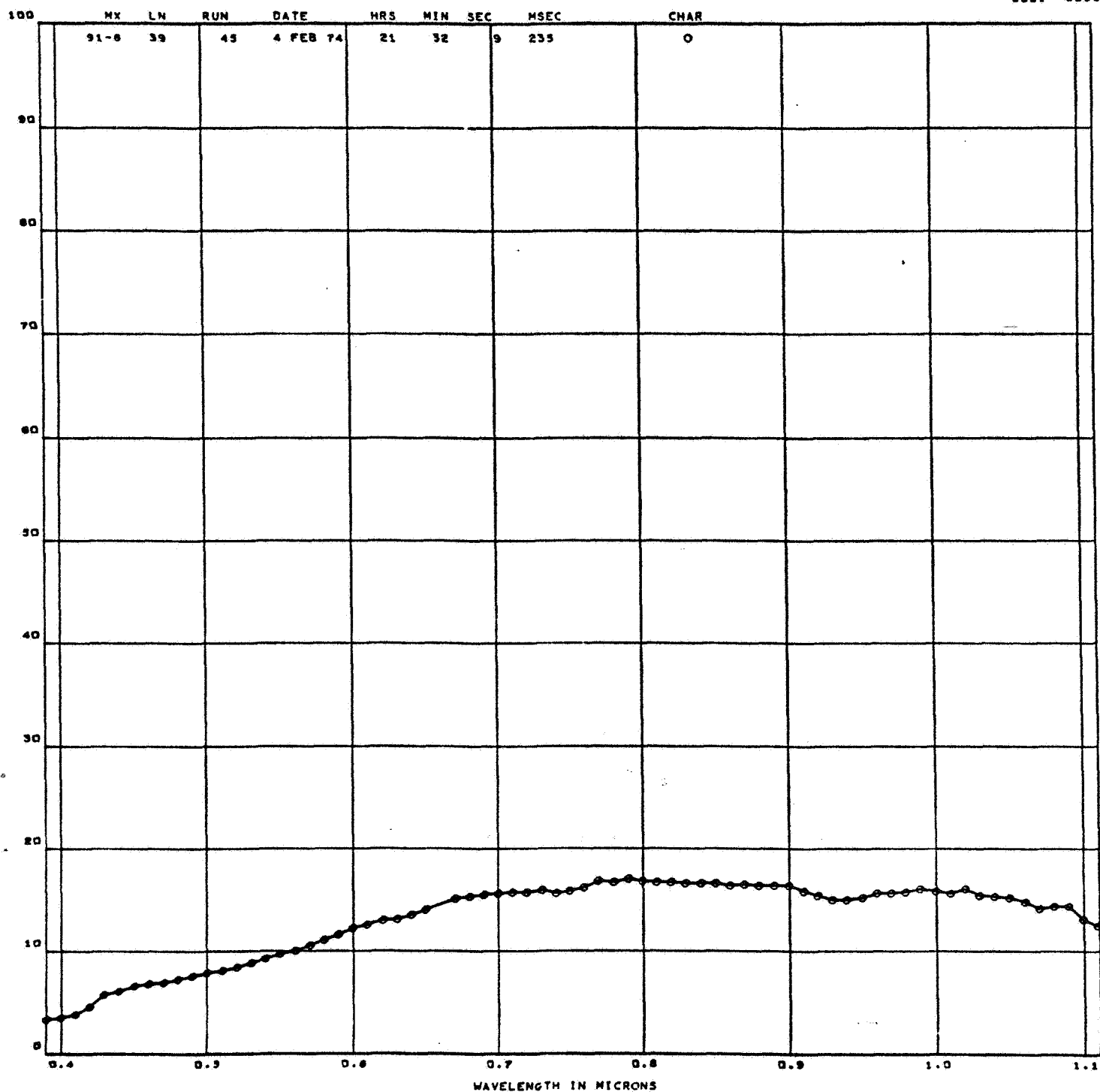
Circle represents spectrometer footprint

PLOT NO. 39

BARE GROUND  
(Dry)

SPECTROMETER SIGNATURE

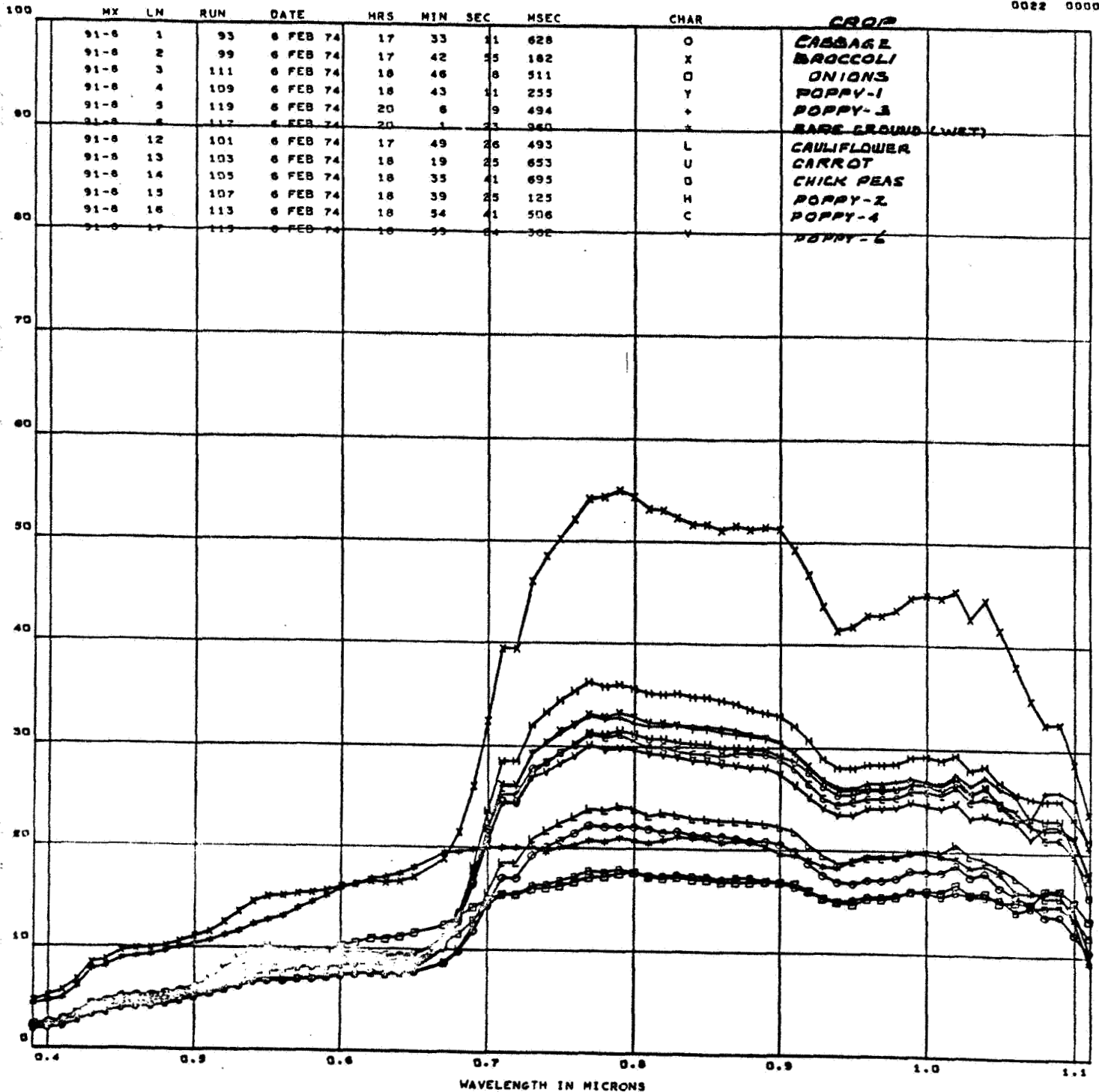
U1108/SC4020  
0021 0000



# MULTIPLE SPECTROMETER CURVES

February 6, 1974

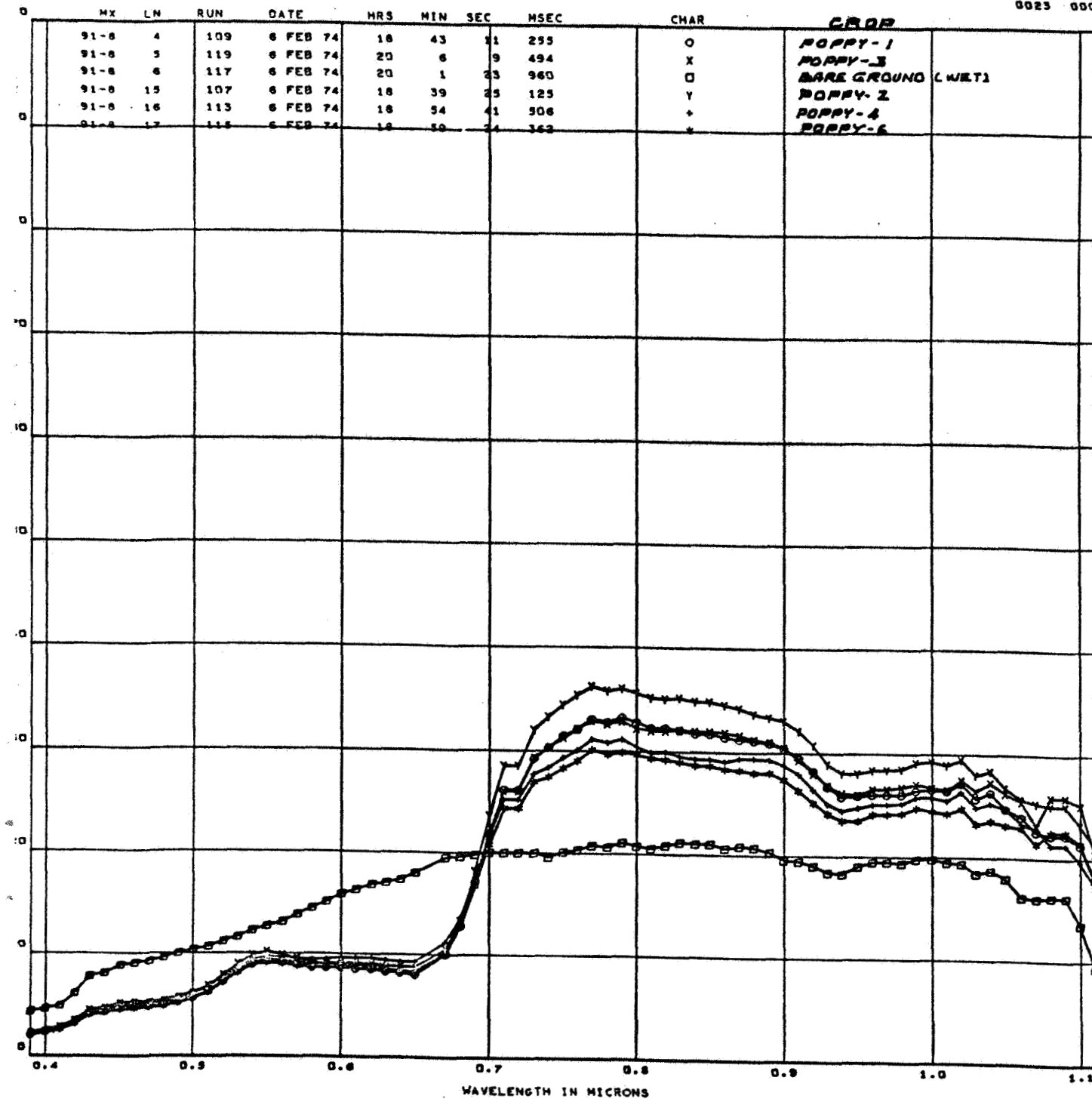
U1106/SC4020  
0022 0000



# MULTIPLE SPECTROMETER CURVES

February 6, 1974

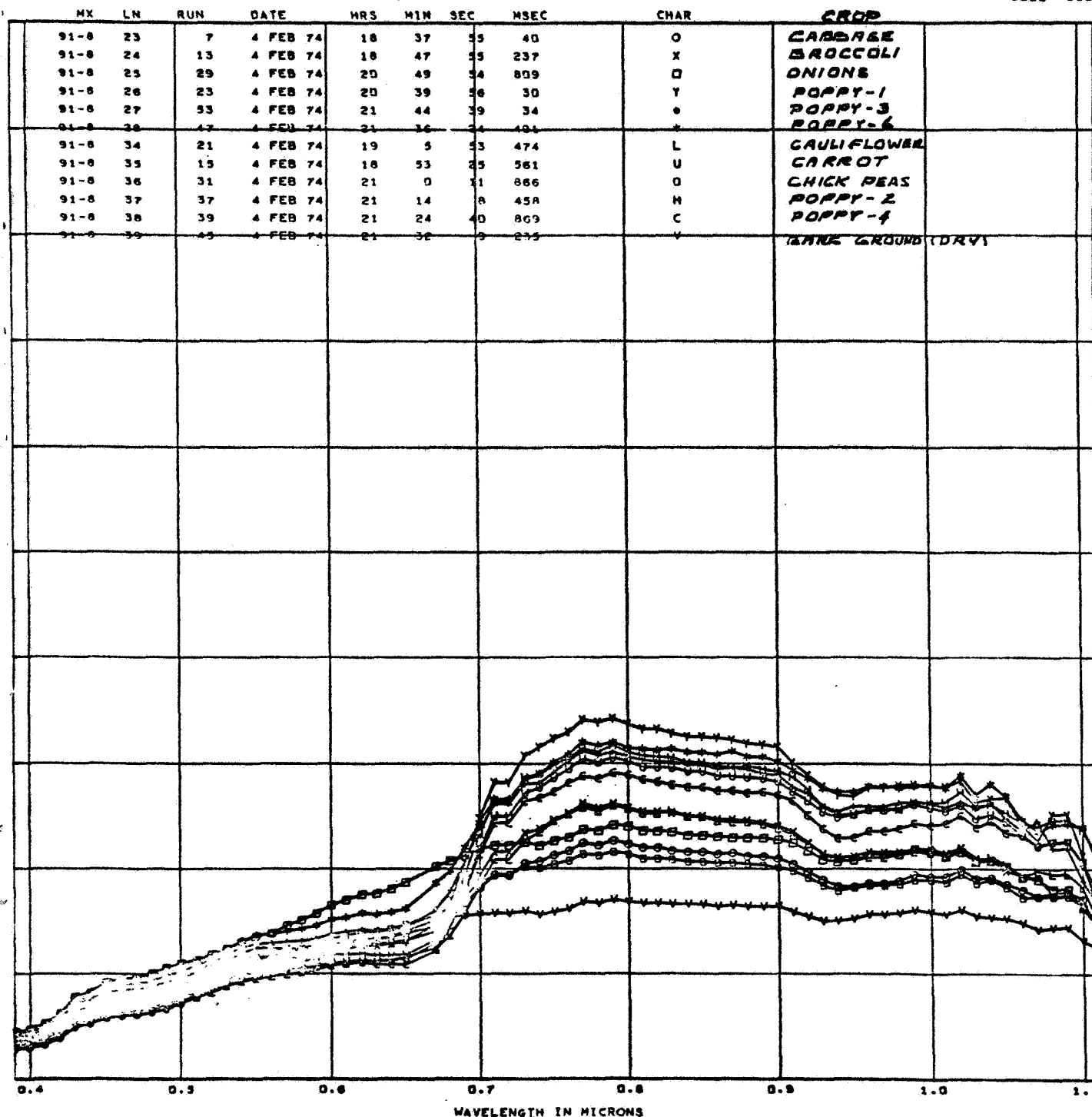
U1108/SC4020  
0023 0000



# MULTIPLE SPECTROMETER CURVES

February 4, 1974

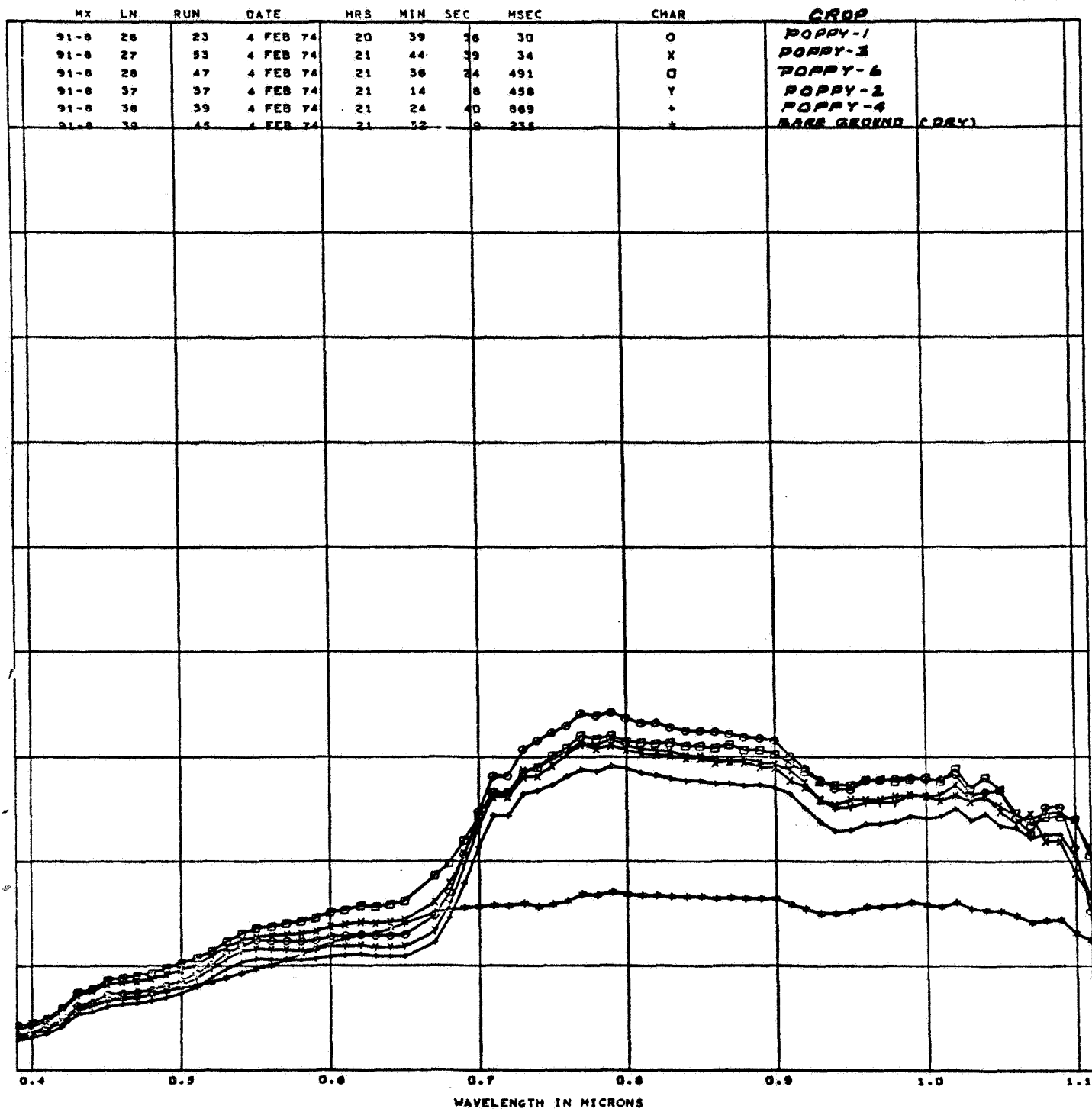
U1108/SC4020  
0022 0000



# MULTIPLE SPECTROMETER CURVES

February 4, 1974

U1108/SC4020  
0023 0000





PLOT NO. 51

POPPY - 1  
(Acquisition No. B-40-6-3)

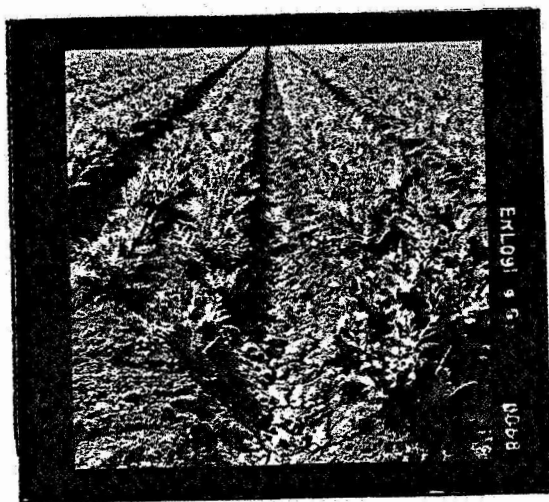
CROP HISTORY

Nov 6, 1973	Fertilized with 50lbs N/Ac
Nov 11, 1973	Irrigated
Nov 13, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 19, 1973	Thinned
Dec 27, 1973	Cultivated
Jan 9, 1974	Hoed weeds
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 14, 1974	Thinned double plants - Irrigated
Jan 28, 1974	Hoed weeds
Jan 31, 1974	6 cm test plants N - S too close, E - W 13", height 7" 12 cm N - S too close, E - W 11", height 4.5 "

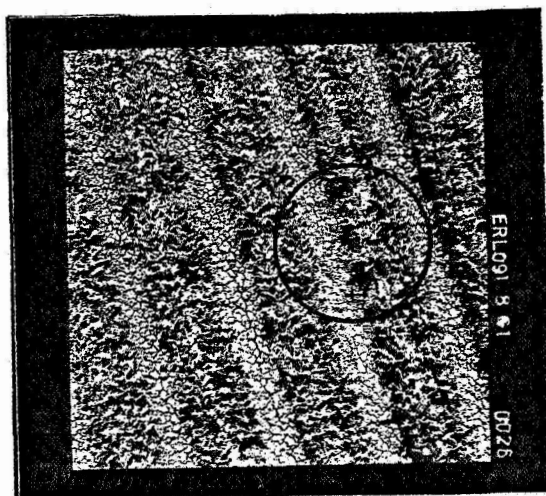
PLOT NO. 51

POPPY - 1

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

Circle represents spectrometer footprint

PLOT NO. 51

POPPY-1  
(Acquisition No. B-40-6-3)  
( 6 cm spacing)

GROUND TRUTH DATA

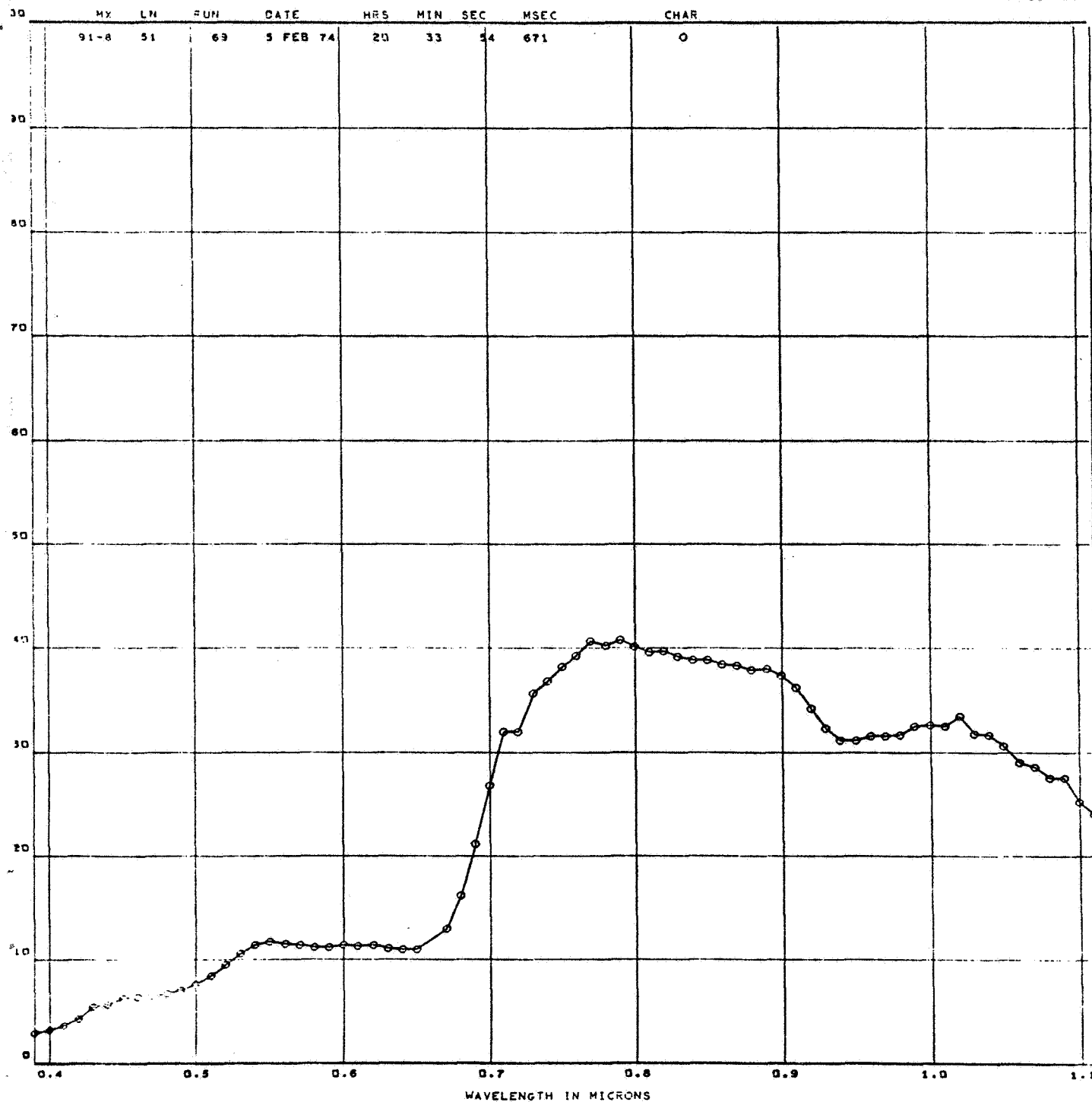
DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Jan 3, 1974	1	3	Moist 1.5" down	Normal	-
Jan 10, 1974	2	-	Moist .5" down	Normal	-
Jan 14, 1974	3	15	Wet	Normal	-
Jan 25, 1974	5	25	Moist 1" down	Normal	No weeds Salt on rows - Jan 21, 1974
Jan 30, 1974	7	33	Moist 2" down	Normal	-
Feb 7, 1974	11	33	Dry	Normal	No weeds

PLOT NO. 51

POPPY-1

SPECTROMETER SIGNATURE

U1108/3C4020  
0011 0000



# OVERVIEW PHOTOS

FEBRUARY 5, 1974

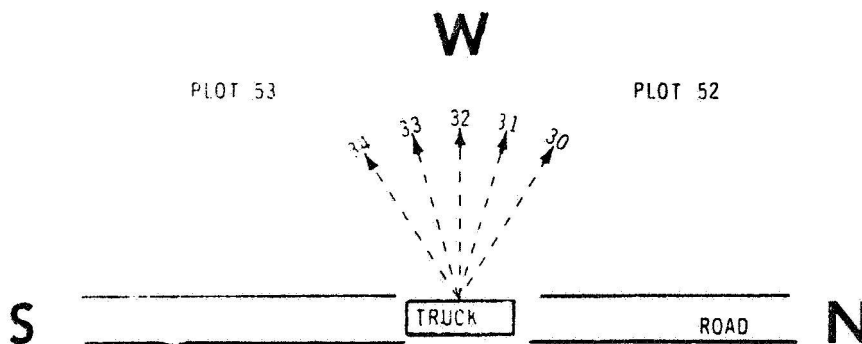
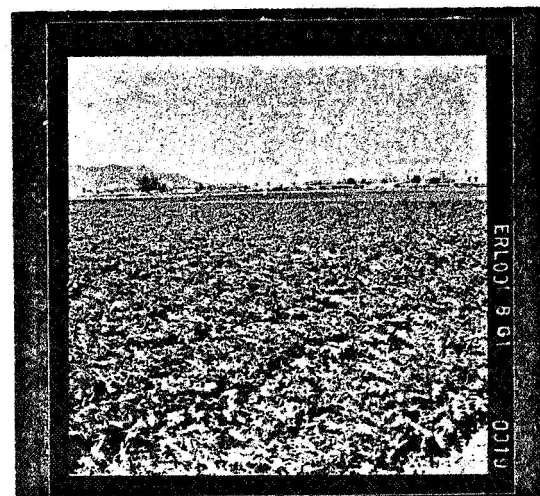
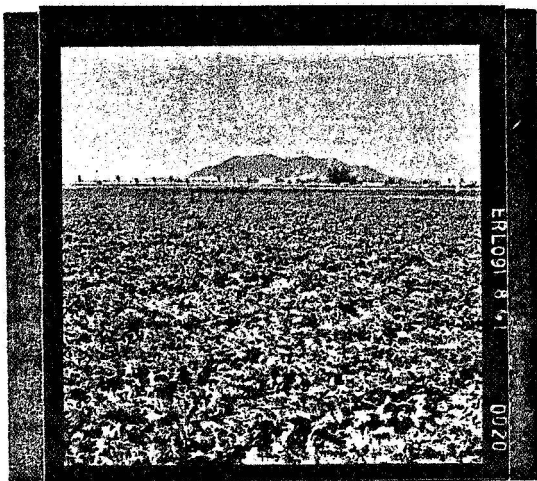
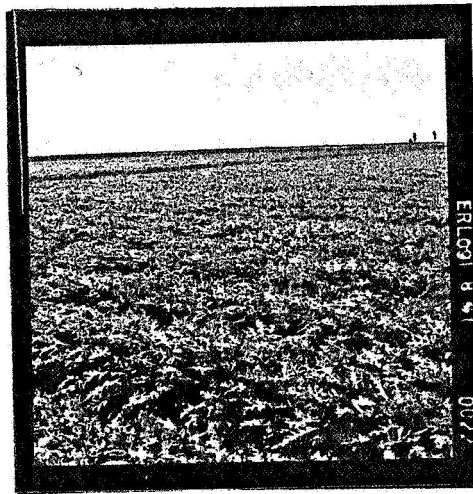
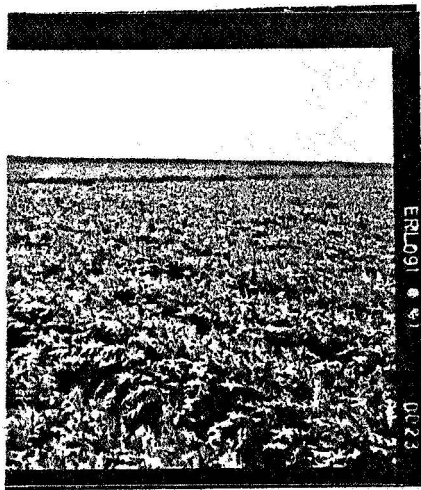


DIAGRAM INDICATES THE APPROXIMATE CAMERA ANGLES OF THE OVERVIEW PHOTOS ABOVE

FEBRUARY 5, 1974



VIEW NORTH

PLOT NO. 52

GROUND LEVEL



VIEW SOUTH

PLOT NO. 53

GROUND LEVEL

PLOT NO. 52

POPPY - 2  
(Acquisition No. 81-89)

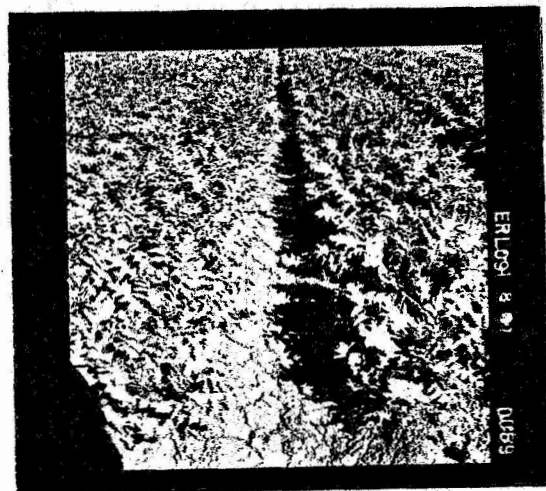
CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac - Planted
Nov 11, 1973	Irrigated
Nov 13, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 17, 1973	Thinned
Dec 27, 1973	Cultivated
Jan 9, 1974	Hoed weeds
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 14, 1974	Thinned double plants - Irrigated
Jan 28, 1974	Hoed weeds

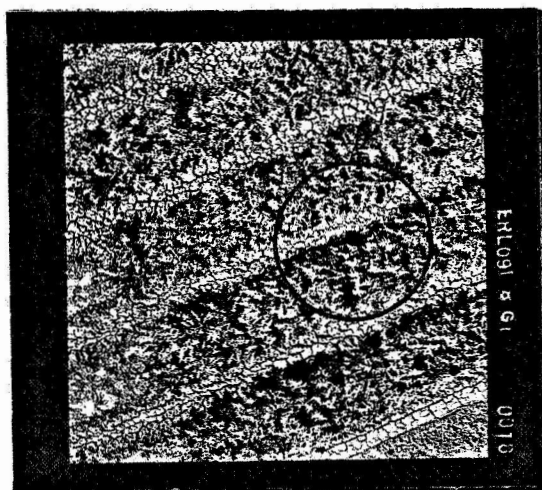
PLOT NO. 52

POPPY - 2

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

Circle represents spectrometer footprint



PLOT NO. 52

POPPY -2  
(Acquisition No. M-89)  
(18 cm spacing )

# GROUND TRUTH DATA

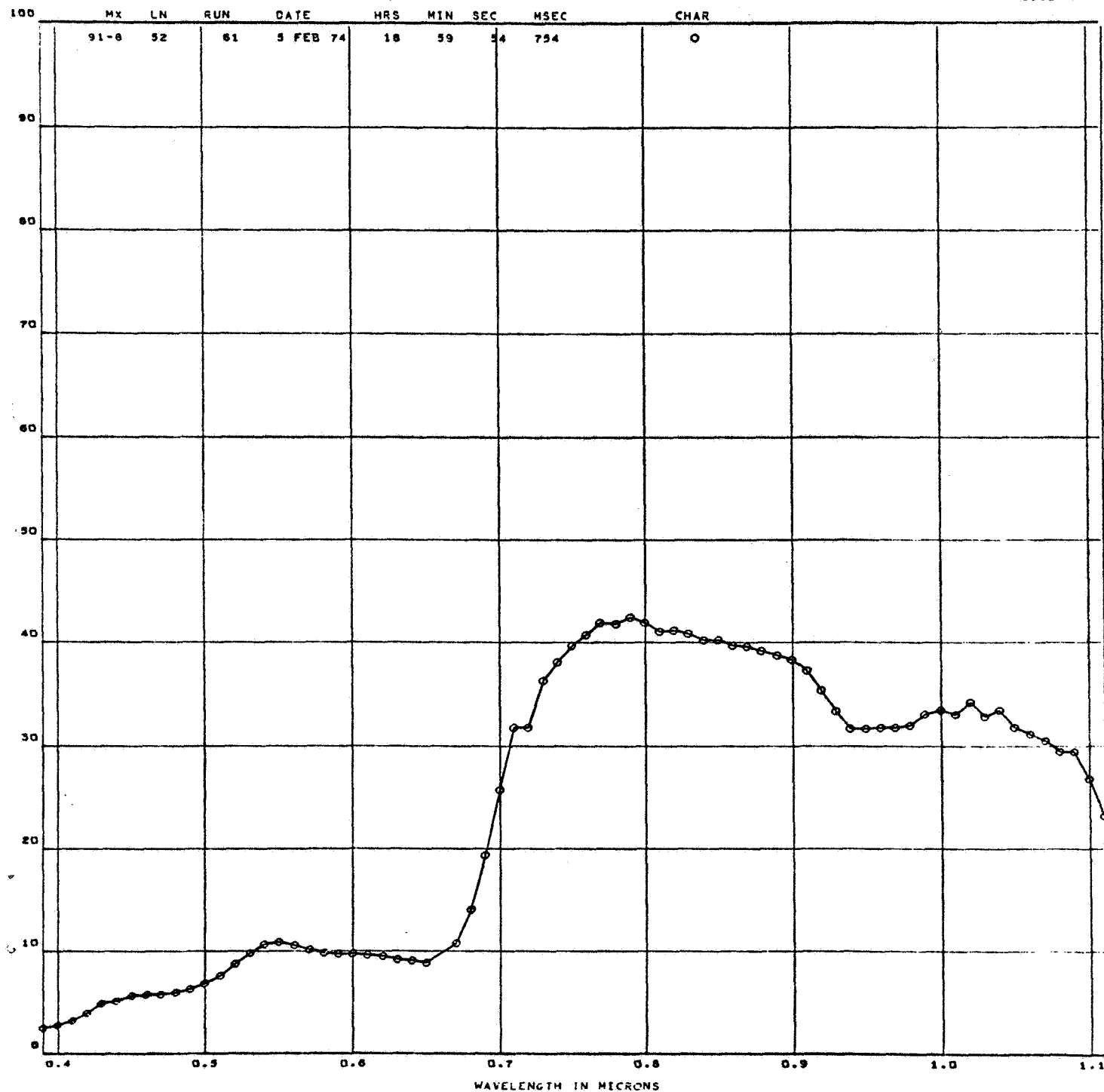
DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Jan 3, 1974	1.5	5	Moist 1.5" down	Normal	-
Jan 10, 1974	3	13	Moist .5" down	Normal	-
Jan 14, 1974	3.5	20	Wet	Normal	-
Jan 25, 1974	6	33	Moist 1" down	Normal	No weeds
					Salt on rows -
					Jan 21, 1974
Jan 30, 1974	7	35	Moist 2" down	Normal	-
Feb 7, 1974	12	50	Dry	Normal	No weeds

PLOT NO. 52

POPPY-2

SPECTROMETER SIGNATURE

U1108/SC4020  
0012 0000



PLOT NO. 53

POPPY - 2  
(Acquisition No. M-89)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac -- Planted
Nov 11, 1973	Irrigated
Nov 13, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 19, 1973	Thinned
Dec 27, 1973	Cultivated
Jan 9, 1974	Hoed weeds
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 14, 1974	Thinned double plants - Irrigated
Jan 28, 1974	Hoed weeds

PLOT NO., 53

POPPY-2  
(Acquisition No. M-89)  
(6 cm spacing)

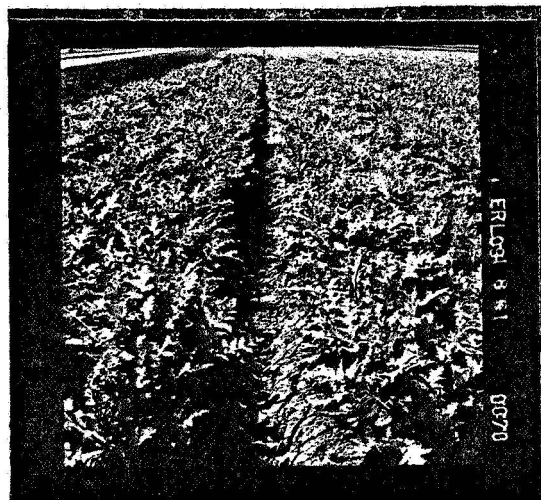
GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Jan 3, 1974	1.5-2.5	10	Moist 1.5" down	Normal	-
Jan 10, 1974	3	15	Moist .5" down	Normal	-
Jan 14, 1974	4	25	Wet	Normal	-
Jan 25, 1974	8	35	Moist 1" down	Normal	No weeds Salt on rows - Jan 21, 1974
Jan 30, 1974	9	37	Moist 2" down	Normal	-
Feb 7, 1974	14	60	Dry	Normal	No weeds

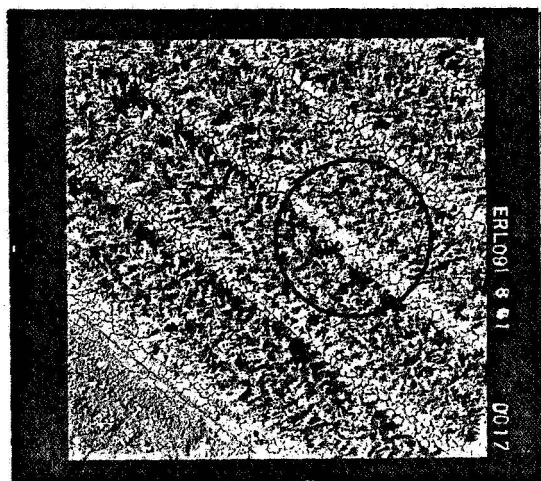
PLOT NO. 53

POPPY - 2

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

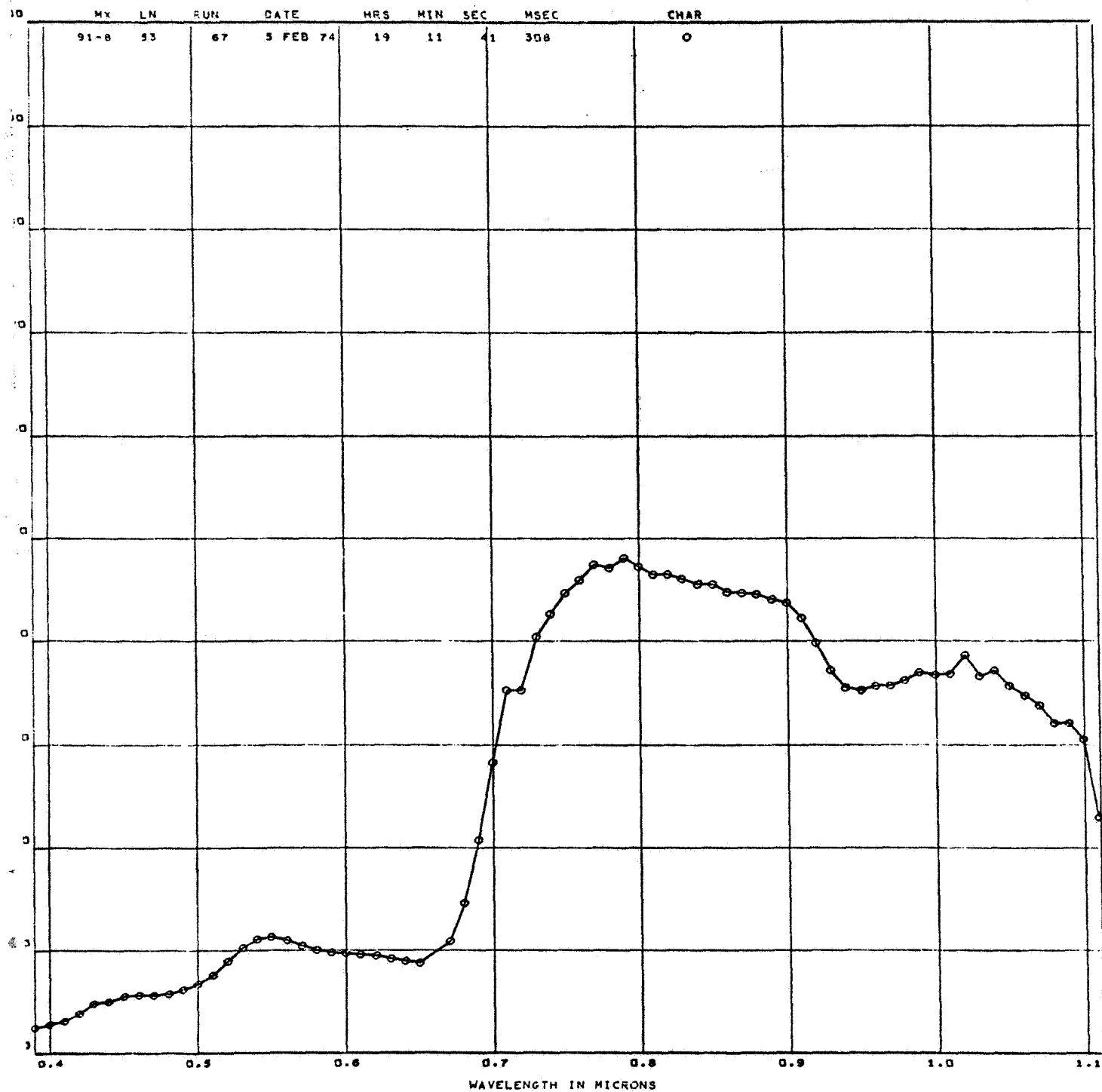
Circle represents spectrometer footprint

PLOT NO. 53

POPPY-2

# SPECTROMETER SIGNATURE

U1108/5C4020  
0013 0000



PLOT NO. 54

POPPY - 2  
(Acquisition No. M-89)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac - Planted
Nov 11, 1973	Irrigated
Nov 13, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 21, 1973	Thinned
Dec 27, 1973	Cultivated
Jan 9, 1974	Hoed weeds
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 14, 1974	Thinned double plants - Irrigated
Jan 28, 1974	Hoed weeds

PLOT NO. 54

POPPY-2  
(Acquisition No. M-89)  
(12 cm spacing)

# GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Jan 3, 1974	1	5	Moist 1.5" down	Normal	-
Jan 10, 1974	2	10	Moist .5" down	Normal	-
Jan 14, 1974	3	15	Wet	Normal	-
Jan 25, 1974	4	20	Moist 1" down	Normal	No weeds Salt on rows - Jan 21, 1974
Jan 30, 1974	6	23	Moist 2" down	Normal	-
Feb 7, 1974	10	40	Dry	Normal	No weeds



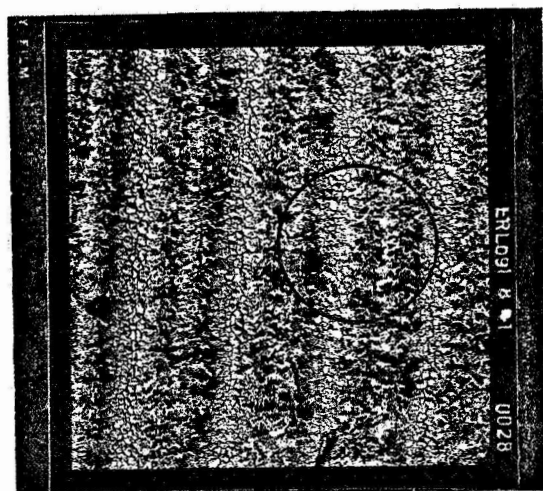
PLOT NO. 54

POPPY - 2

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

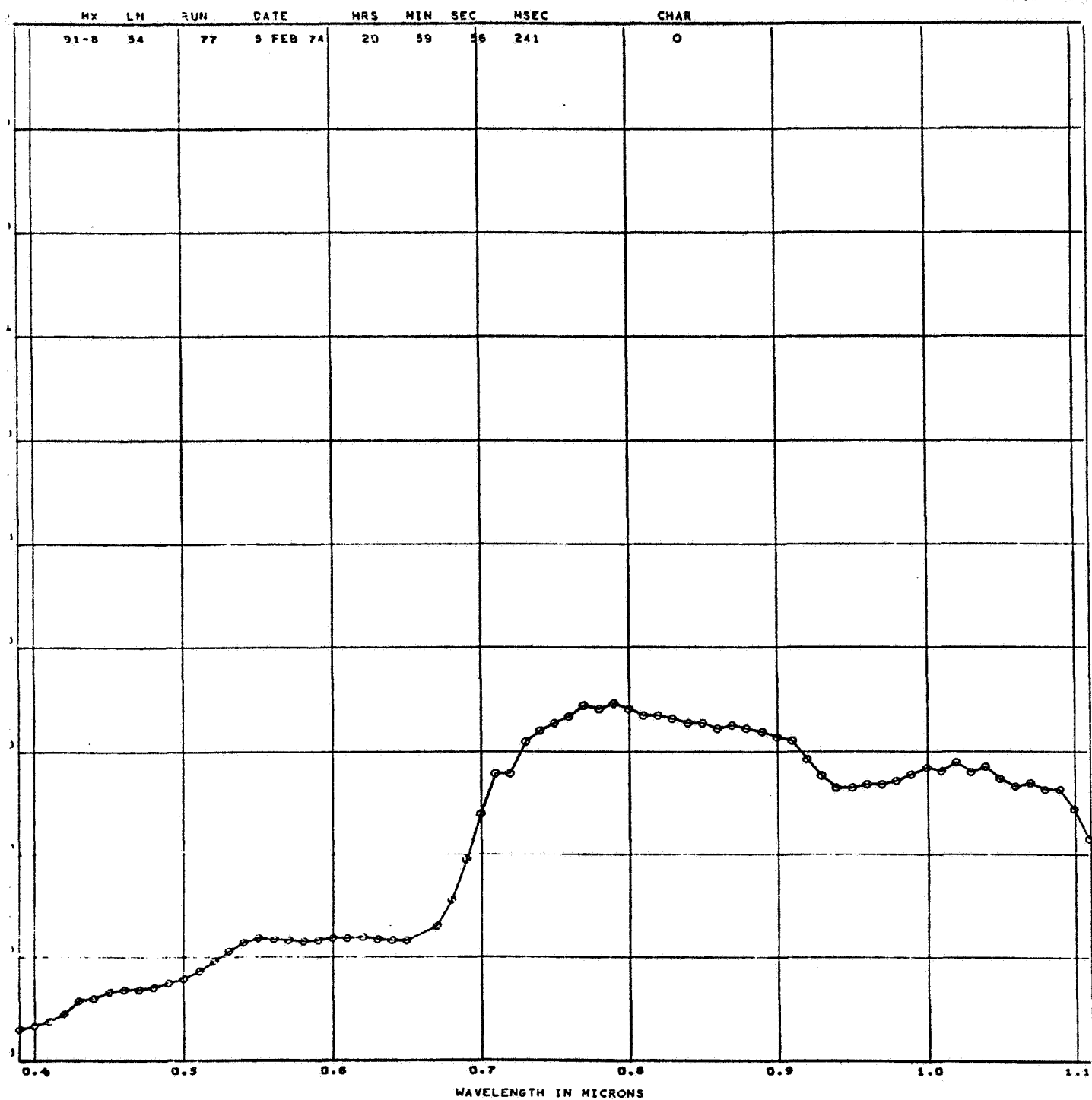
Circle represents spectrometer footprint

PLOT NO. 54

POPPY-2

SPECTROMETER SIGNATURE

U1108/SC4020  
0014 0000



PLOT NO. 55

POPPY - 1  
(Acquisition No. B-40-6-3)

CROP HISTORY

Nov 6, 1973	Fertilized with 50 lbs N/Ac - Planted
Nov 11, 1973	Irrigated
Nov 13, 1973	First emergence
Nov 15, 1973	Up to a stand
Dec 7, 1973	Fertilized with 50 lbs N/Ac - Irrigated
Dec 27, 1973	Thinned - Cultivated
Jan 9, 1974	Hoed weeds
Jan 11, 1974	Sidedressed with 50 lbs N/Ac
Jan 14, 1974	Thinned double plants - Irrigated
Jan 28, 1974	Hoed weeds
Jan 31, 1974	18 cm test plants N - S 12", E- W 14.5", height 5".

PLOT NO. 55

POPPY-1  
(Acquisition No. B-40-6-3)  
(18 cm spacing)

GROUND TRUTH DATA

DATE	CROP HEIGHT (inches)	GROUND COVER %	GROUND SURFACE CONDITIONS	CROP CONDITION	COMMENTS
Jan 3, 1974	1	3	Moist 1.5" down	Normal	-
Jan 10, 1974	2	12	Moist .5" down	Normal	-
Jan 14, 1974	3	15	Wet	Normal	-
Jan 25, 1974	4	20	Moist 1" down	Normal	No weeds Salt on rows - Jan 21, 1974
Jan 30, 1974	6	20	Moist 2" down	Normal	-
Feb 7, 1974	7	30	Dry	Normal	No weeds

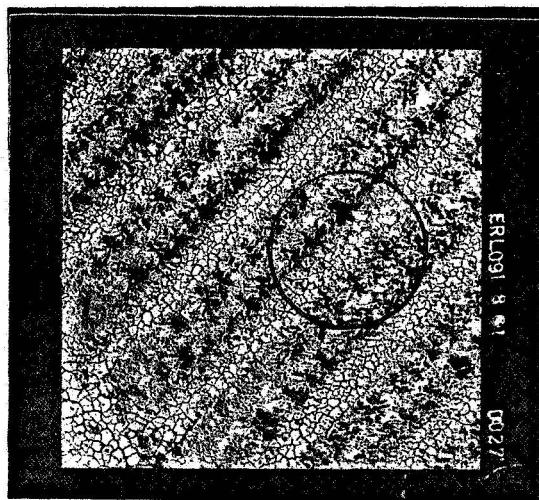
PLOT NO. 55

POPPY - 1

FEBRUARY 4, 1974



GROUND LEVEL



BORESIGHT

Circle represents spectrometer footprint

PLOT NO. 55

POPPY-1

SPECTROMETER SIGNATURE

U1108/SC4020  
0019 0000

